AMERICAN GAS *Association* MONTHLY

JULY-AUGUST 1947 • VOL. 29 · NO. 7 AND 8

YOUR SILENT SALESMAN

In The New Home Building Field

● PUT IT TO WORK
. . . to build for the future

The Reference Manual has been specifically designed to provide the men who plan, build and finance the homes of America with complete information on specifying and installing modern gas service. With this data at their finger tips, it will be easy for them to specify GAS instead of competitive equipment.

● PUT IT TO WORK
. . . to build good will

By providing your local architects and builders with a copy of the Manual, you literally "open the door" to the vast new home market. As you know, the home market sets the pattern for modernization and replacement so you will also capture this business. Architects and builders will value and appreciate this distinct service and will welcome your representative whenever he calls. Such good will and public relations will pay you dividends.

● PUT IT TO WORK
. . . it's yours

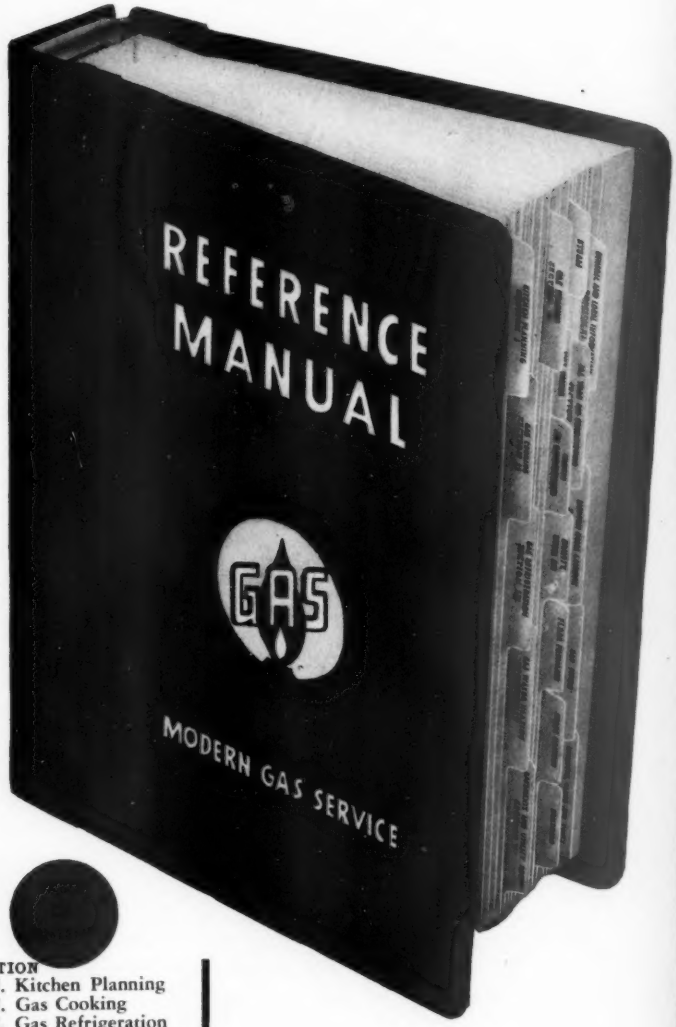
The gas industry can well be proud of the Manual which has been acclaimed by architects and builders as one of the most helpful and complete publications ever produced by any industry. You will be proud to make it available to the important factors in your local building field.

● 10,000 ARE ALREADY AT WORK

The first 10,000 copies of the Manual are already at work in the territories of nearly 350 gas utility companies, but many gas companies have ordered only a fraction of their local needs. Check your list of architects and builders. Do you have enough for your real requirements?

● 5,000 MORE WAITING
. . . to be put to work

A new limited run of 5,000 copies will be ready by the middle of July. This is your LAST opportunity to make sure that you have adequately covered your local architects, builders, banks and others.



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AMERICAN GAS ASSOCIATION
420 Lexington Avenue, New York 17, N. Y.

Please send ( ) copies of the Reference Manual of Modern Gas Service at $7.50 per copy, F.O.B., Newark, N. J.

Name .....

Company .....

Street .....

City .....Zone No. ..... State .....

No vacation for the gas industry this summer! Instead, more work than ever before. . . . A three-year extension of the enlarged gas promotion, advertising and research plan has just been launched. . . . The Association's general nominating committee has selected a strong, capable slate for presentation at the October convention. . . . The framework of that annual event already has been erected. . . . A highly successful Production and Chemical Conference and a lively Sales Conference have been added to the records. . . . Bimetallic thermal element studies and extensive tests of orifice meters offer valuable data to technical men. . . . On the industry front, gas-fired all-year air conditioning has been placed in production. . . . Neighborhood cooking schools have aided gas company public relations in Baltimore. . . . A fullscale promotional campaign and ingenious vehicles have speeded two changeovers to natural gas in Texas and Illinois. . . . A clear-cut distribution plan has enabled a New Jersey utility to put to work the "Reference Manual of Modern Gas Service." . . . "Sendout Growth—Threat and Promise" is examined by Clifford E. Paige. . . . A report on a "New Oil Gas Process" and the legal background of "Well-Head Price Fixing" all are part of the picture.

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Sendout Growth—Threat and Promise

BY CLIFFORD E. PAIGE

Chairman of the Board and President, The Brooklyn Union Gas Co., Brooklyn, N. Y.

IT was a long winter and for many a cold and hard one. What will next winter be? Prospects look tough now but maybe by the time winter comes we will be better prepared to cope with its effects.

I mention a threat—the ever-present dread in the dead of winter that customers' demand will run ahead of our ability to supply. I shall also discuss the promise of the future when the present phenomena are reduced to reasonable dimensions and control.

In telling the story of sendout growth at Brooklyn Union, you will recognize much that is similar to your own experience, for many of us seem to be sharing the most remarkable situation that our business has met in its hundred years of service to the community.

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In 1943 Brooklyn Union began looking over its field to estimate what business would be available after the war. Projections of output curves indicated a very substantial increase in the following ten years. But about a year ago everything changed and we found ourselves in the midst of a stampeding sellers' market, centered mostly in unprecedented demands for gas house heating. Why, why all of a sudden did so many people want our service? There is probably no one answer but a number of reasons may be suggested:

1. For several winters people had trouble getting other fuel supplies, but gas had never failed.
2. People had money. They looked on gas heat not so much as luxury but as security against privation.
3. People felt sure that if they had gas they could get heat and moreover service for equipment.

There are probably other reasons. Certainly the careful work of past years in looking after the house heating phase of our activity bore fruit. All through the war years there had been a demand for gas heating equipment but it had quieted down somewhat because practically everybody knew that none could be had. At the end of the war people suddenly realized that many of the things which had been unavailable might now be obtained. But we never anticipated being asked to meet such large increases in this form of sendout. We attained in a year the output figures which careful projections had indicated might be reached in five years after the war.

I remind you that the dilemma was by no means confined to the territory served by Brooklyn Union but seemed quite general throughout the northern part of the country. The difficulty in meeting demands was not confined to manufactured gas. Users of natural gas had their bad moments as well. As far as I know, LP-gas users did fairly well if they could get shipments through. In natural gas it was largely pipeline and compressor capacity. In manufactured gas operations the difficulty was production capacity. Besides, there was the uncertainty in gas works of getting through supplies of raw materials. Companies making coal gas have had to struggle constantly to maintain safe reserve coal stocks ever since the war began. Mining suspensions and transportation difficulties have made many companies run up stocks when possible, even into high inventory figures, due to fear of supply interruptions.

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Incidentally the costs of all materials went up constantly during the war and even more so since that time. These higher costs are not confined to our business but are effects which all business feels. Especially in the earlier rises in costs, we had some offsets in higher values for by-products.

The extraordinary demand for gas continues unabated. Manufactured and natural gas companies are straining every

Presented at A. G. A. Production and Chemical Conference, June 2, Hotel New Yorker, N. Y.

● Opposite: 10,000-pound clamshell bucket unloading coal from hold of steamship at Kearny, N. J., plant of Koppers Seaboard Coke Co. which turns out 3,000 tons of coke daily. Coal is moved to coking ovens by crane conveyor. Photo by Ewing Galloway.

resource to provide relief. "Straining every resource" is no figure of speech.

I should like to pay special tribute to those who through the past winter helped meet the situation brought on by the relatively unsought house heating demand. Largely on you fell the burden of keeping "pressure on the mains." It is greatly to your credit that with the prevailing manpower shortage, limited capacity and extensive demands, you contrived, except in a few isolated instances, to maintain successful service and literally to "keep the home fires burning." At Brooklyn Union I think we have never seen a finer example of people rising to an emergency and meeting it successfully. Such examples happened repeatedly last winter.

Like most gas companies, we began to prepare for a great future even before the war ended. You remember Alex Beebee's Post-War Planning Committee and the dozens of engineers, chemists and salesmen who worked on plans and developments. At this point I pay tribute to those who largely kept us going through the war, especially Ernest Acker and Alexander Macomber. I also call attention to the magnificent promise of the research work which is so well-organized and directed at the Institute of Gas Technology and elsewhere by the Research Committees of the American Gas Association.

Preparing for Winter

In 1943 we in Brooklyn felt fairly well decided on what would be needed for manufacturing and distributing capacity. Through 1944 plans were made. In 1945 orders were placed. Our apparent slowness was due to the fact that no equipment could be bought sooner anyway. Construction in most cases was started early in 1946. Ordinarily plenty of capacity for expected sendouts could be made ready for winter 1946-47.

But the winter was not normal in any sense. Just a suggestion of a cold wave and up went the sendout figures and the burden on our facilities. Delays due to strikes and stoppages slowed up deliveries of materials for production and construction and no schedules could be kept. Annoyances and heart-breaks were common. Our New Business Department hated to see a reduction in sales of appliances but had to admit that the prospective load could not be met.

We sought to restrict the sale of house heating installations and the sale of gas to new heating users. The New York State Public Service Commission issued an order, effective November 16, 1946 to April 1, 1947, curtailing sales of gas for additional space heating equipment. On April 1, 1947 this order was extended to November 1, 1947, when it became evident that without such limitation we could not hope to meet the demands predicted for next winter.

Early in 1944 we thought that manufacturing capacity might need $5 million for new plant. In 1945 it looked as if $10 million would be hardly enough. By the end of 1946, and due to this entirely new situation, our figure had risen to $24 million. This included additional production capacity and extensions to distribution facilities as well as all other capital expenditures. Naturally directors, bankers and Commission representatives all wanted to know if this would be the end. The only answer was and still is, "Who knows?"

Through last winter we showed continuously much higher gross revenue figures than ever before, but earnings, feeling the effect of higher prices for raw materials and sharply increased labor costs, have been declining steadily. Other businesses feeling these same effects have adjusted accordingly. In the regulated gas industry, however, adjustment by rate relief must come through Commission action and approval, although it is probably safe to say that in recent years more gas rates have been determined by competition than by regulation. Although earnings were falling off, the need for additional plant for ever-increasing send-out became more and more insistent.

Embarking on a $24 million capital

Gas Industry Endorses New

THE recommendations of a Special Reviewing Committee to continue upon an enlarged basis the program of promotion, advertising and research ("P.A.R. Plan") which the gas industry inaugurated in 1944 have been approved by the Executive Board and the Executive Conference of the American Gas Association. The new plan calls for the expenditure of approximately $4,800,000 in the next three years, an increase of about $600,000 over the initial program.

A. G. A. promotional work in the present year, including national advertising, special promotional activities, residential and commercial sectional activities and publicity will cost about $1,278,000. These activities supplement and augment those of the gas utility companies which in a normal year spend about $25 million, and activities of manufacturers representing an additional $10 million. Promotional, advertising and research plans are as follows:

National Advertising

Approximately $2,240,000 allocated and spent during the first three years of the original plan. During this period, 574 million messages were carried to 127 million readers. It is estimated that $800,000 will be spent the fourth year.

Promotional Activities

For the first three years of the plan $583,732 allocated and spent. Of this amount $213,450 is expected to be recovered through resale of materials. The balance of approximately $229,000 will be used during the fourth year of the expanded plan. Activities undertaken include a public opinion survey, a commercial cooking program, participation in national shows, Hollywood contact work, gas service, consumer range and laundry manuals, New Freedom Gas Kitchen promotion, a modern, automatic gas range motion picture, picture story

outlay, we had cash resources of $6 million. When that was spent it was necessary to go to the banks for loans pending some permanent financing. The bankers asked at once if our rates were adequate for the new volume of gas we had to produce, or would the overhead costs on the new investment dilute the return on the existing one, since the new equipment was largely for peak load relief. This question had been in our own minds a long time.

We knew that a labor contract had to be negotiated and that our rates had to be increased. We knew there could be no retroactive rate relief and that no relief could be had in advance of being "hurt." Our new labor contract was executed on February 26, 1947. This added an estimated $1.7 million to our annual payroll. On the same day we filed with the Public Service Commission an application for rate relief in the amount of $1.9 million. We tried to make it clear that the urgency of our need was so great that we wished to make a five cent increase "across the board" with one exception. This is what railroads call "revenue relief." Our house heating rate was the only exception. For this we asked an increase of from 50 cents to 60 cents per M.c.f. Bear in mind that most of our expansion program is to supply house heating customers. Moreover, house heating customers get all domestic gas through the same meter, summer and winter. We hope for an early rate decision.

I have intimated that a large part of our construction program is to take care of the tremendous demand for house heating. This is true at the moment, but not for long, because our increase in sendout under much better load factor conditions will, we believe, take up our base load capacity within a reasonable time and our very highest peaks will be relieved by the minimum of capital outlay, namely LP-gas equipment.

I have given our experience more or less as a sample of what most companies, especially in this general area, have been through. Briefly what are gas companies doing in this situation?

Gas industry representatives are grappling at this meeting with the urgent and imminent problems of the business and determining future contributions to it. You have a splendid program, and men of remarkable competence to handle it. More than that you have in the American Gas Association probably the world's most successful business achievement in free discussion, mutual helpfulness and confidence. Success comes to the man who loves his work. It takes other things, but love of a job is a primary requisite *(Continued on next page)*

Enlarged Three-Year "P.A.R. Plan"

books and teachers' manuals on care and use of the modern automatic gas range and modern laundries.

Publicity Activities

Covered financial and business news, general association and industry activities, publicity on domestic gas appliances in women's magazines, newspapers and radio, and industrial and commercial coverage in specialized publications and trade magazines.

Gas Production Research Allocations

Totaled $1,050,000 for the first three year period, with expenditures amounting to approximately $725,000. It is estimated that $359,000 will be spent in the fourth year. Projects carried on under the gas production research program include laboratory and pilot plant studies of catalytic reforming, high B.t.u. plant tests and mixed gas studies. Fundamental work on methods and processes includes by-product studies such as tar, oil and gas analyses; catalyst studies, conversion and purification problems; process gasification studies and studies of water gas reaction.

Domestic Gas Research Allocations

In the first three years of the plan amounted to $450,000, with expenditures totaling about $435,000. It is estimated that $150,000 will be spent in the fourth year. Projects were grouped in four general classifications—gas cooking, water heating, central and direct gas heating research and burners, controls and accessories research. Individual studies ranged from oven performance and kitchen ventilation and humidification through improved ignition, temperature control, heat transfer, summer-winter air conditioning and projected new household heat applications.

Industrial and Commercial Gas, General Gas Research

$150,000 each allocated three years of the original plan. Approximately $105,000 spent on industrial and commercial research and estimated that an additional $50,000 will be spent in the fourth year of the program. Projects included improved metallurgical and ceramic heating processes, high temperature furnace designs, commercial refrigeration and improved heat applications to contemporary commercial appliances. General technical research covered such subjects as hydrates in pipelines, pipe coating and corrosion, organic sulfur removal and storage of natural gas as a hydrate. Approximately $156,000 spent on research of this type in the first three years and $150,000 has been allocated for the fourth year.

Many of the studies are continuing projects that will be carried on during the enlarged research and promotional program. Committees charged with selection of projects for the research program continually are sifting and selecting proposed studies to improve manufacturing, transmission and distribution processes, to attain a better product and improved service at lower costs to the customer.

for achievement. You have done much in the past. Your comprehensive research programs will beat cumulative and highly beneficial results. You are building splendidly for the future, and all indications point to bright opportunities and prospects.

Returning to sendout in the light of recent experiences there are certain things to recognize and remember. If gross revenue increases, it generally means more volume of sales. More volume involves expansion, which in turn means expenditure. Expenditure means money. Money means earnings, and earnings turn on rates. We have to know if the business which we acquire is profitable business at our published rates. And we have to know this especially in the house heating field. Is your house heating rate adequate with due consideration for load factor? Before the war we sought house heating business and brought rates down in order to get it. That was fine and this business made a good contribution to earnings as long as it was incremental, in other words, could be built up to then existing plant facilities. But what rate is necessary to pay capital charges on equipment used only for peak load thus created? And what part of that rate determination belongs with the consideration that the house heating load is a considerable factor in keeping other appliance loads on our lines?

We must sell gas cheap, and therefore must produce it cheaply. We must keep in mind that the cost of capital is a very definite addition to the cost of production. I have said expansion means expenditure, and that earnings turn on rates. What do you know about rate allocations? You can make explanations, but what can you prove about legal costs for different classes of service? It is quite likely that we will all have to learn more about this subject if we are seeking further rate differentiation, especially when one service classification appears to need an increase.

Primary Interest

We have an interest in this matter which is one of business even more than of regulatory importance. What effect will a higher house heating rate have on this class of business? Again, "Who knows?" We do know that the demand was so sudden and so insistent that we couldn't wait for natural gas even if it would have been useful in peak shaving. Those of us who now make gas are as much concerned with the effect on peak loads when natural gas becomes available as on almost any other aspect of the business.

Is the demand for house heating gas likely to continue? You know many people placed orders for automobiles with half a dozen dealers. When they finally received a car they canceled five orders. Is our situation similar? We think not. Even if this house heating business does slow up, we believe we will achieve a load large enough to require all our basic capacity in a reasonably short time, and that at the worst we will have anticipated our needs by building ahead rather more than ordinarily. Remember that we are required to furnish gas to all parts of the territory *(Continued on page 346)*

A. G. A. Convention Plans

J French Robinson

THE committee in charge of general arrangements and programs for the general sessions of the twenty-ninth annual convention of the American Gas Association in Cleveland, October 6-8, held a meeting at Association Headquarters July 2. Recently appointed by President Hargrove, the committee consists of J French Robinson, president, The East Ohio Gas Co., Cleveland, chairman; R. J. Canniff, advertising & sales promotion manager, Servel, Inc., Evansville, Ind.; O. R. Doerr, general sales manager, Pacific Gas & Electric Co., San Francisco; B. T. Franck, vice-president, Milwaukee Gas Light Co.; L. C. Harvey, president, The Bryant Heater Co., Cleveland; W. H. Ligon, president, Nashville Gas & Heating Co.; D. E. Maloney, agent, The East Ohio Gas Co.; Irving K. Peck, vice-president, The Manufacturers Light & Heat Co., Pittsburgh; J. J. Quinn, vice-president, Boston Consolidated Gas Co.; E. F. Schmidt, vice-president, Lone Star Gas Co., Dallas; A. H. Stack, president, The Tampa Gas Co.; and Kurwin R. Boyes, A. G. A. Headquarters, secretary.

All indications point to a large attendance at the Convention and housing difficulties commonly experienced today may be expected. Every possible measure is being taken to secure adequate and satisfactory hotel accommodations for all, but the Convention Committee will welcome the cooperation of members in securing double rooms and in otherwise adjusting themselves to the prevailing conditions. Reservations should be made through E. C. Brennan, housing secretary, American Gas Association, 511 Terminal Tower, Cleveland 13, Ohio.

A general plan of meetings was agreed upon including general sessions each morning and section and department meetings in the afternoons. Development of programs for the general sessions is progressing and details will be announced shortly. The most timely subjects will be presented by the foremost available authorities in each field. Over-all plans indicate that the three days of the Cleveland Convention will be jam-packed with events of interest and value to everyone in the gas industry.

All-Gas Air Conditioning Now Reality

Years of research pay off with single-package unit designed to give year round living comfort in large or small homes

Representatives of Cincinnati Gas and Electric Co., which recently expanded its all-year gas air conditioning operations, meeting in Evansville, Ind., with members of the air conditioning division of Servel, Inc. L. to r.: F. J. Middelberg, Carl Wessling, G. J. Kuehnle, Jr., J. A. Gilbreath, Harold Russel, C. T. Ballard, E. H. Keune

GAS for cooling as well as heating the nation's homes is now a reality. Gas industry executives have announced that after 13 years of development and testing including work under actual operating conditions in more than 100 homes, equipment using either natural or manufactured gas is now available for year round air conditioning of small or large residences.

The new all-gas air conditioning units are already in production and more than 1,200 have been shipped during the past year.

Recent magazine surveys showed that from 54 to 72 percent of readers interviewed "like and expect to get" all-year air conditioning in their homes. Concensus of opinion at a recent meeting of top gas utility executives held in New York, one of several meetings to be held throughout the country, was that immediate promotion of all-year gas air conditioning should be launched by the industry.

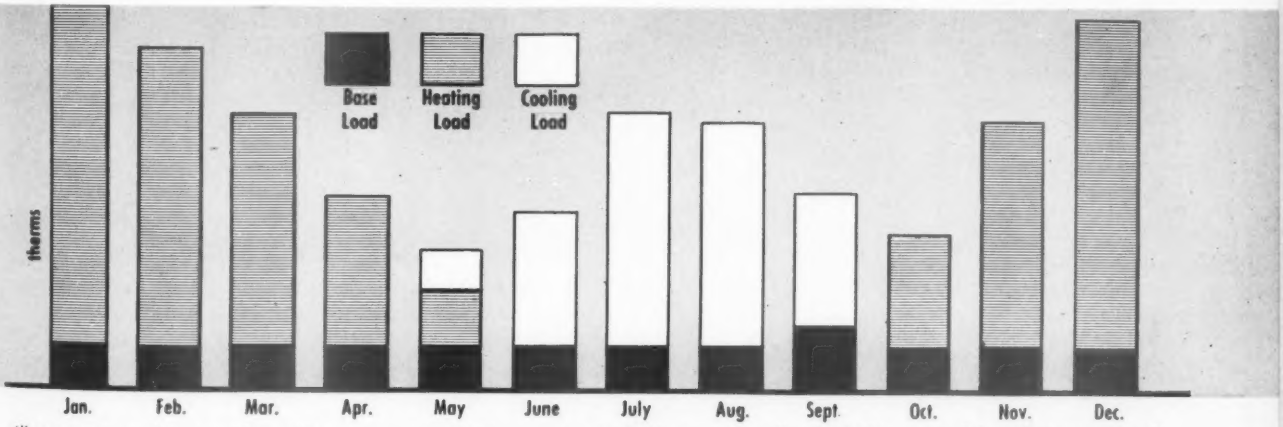
Gas utilities faced with the economic problem of expanding production facilities to meet the huge demand for gas house heating can level off summer-winter peaks and valleys by promoting all-year climate control to ultimate consumers, introducing a new quality of living that is a must in this post-war era.

The finger-tip control provided by gas all-year conditioning has a tremendous consumer appeal in natural gas areas where climatic conditions often make dehumidification and cooling necessary in the summer and only a moderate amount of heat is usually required in the winter.

In spite of temporary gas shortages and restrictions in some areas, the new all-year air conditioning units are available now to consumers using gas for heating, who desire and realize the necessity of replacement of old outmoded gas heating installations.

Company executives point out that limitations placed by some gas utilities upon installations of gas house heating until present restricted availability of gas and transmission facilities is relieved, are only temporary. Other present handicaps to the full use of gas all-year air conditioning such as shortages of steel plate, and tin plate which restrict expansion of the industry, have caused a delay in the installation of all-gas air conditioning as a basic unit in the modern all-gas home of tomorrow.

The idea for the gas air conditioning unit was born in 1934. The hundreds of tests and research studies which were conducted in selected areas up to 1942 provided a scientific basis for further design improvements. From 1942 to the present time, home installations have been checked *(Continued on page 375)*



All-year gas air conditioning offers utility management: (1) A new, more profitable summer cooling load (2) a more balanced year-round residential gas load factor (3) higher net annual income per customer (4) extension of present gas services with no increase in capital investment (5) protection of existing gas loads for house heating, cooking, refrigeration and water heating—Servel News

FOR PRESIDENT

Hudson W. Reed

FOR VICE-PRESIDENTS

R. W. Hendee

H. H. Cuthrell

FOR TREASURER

E. F. Barrett

FOR DIRECTORS

W. C. Beckjord

E. G. Boyer

H. R. Cook, Jr.

E. H. Eacker

J. N. Greene

D. A. Hulcy

F. A. Lydecker

J. S. Moulton

E. P. Noppel

J. A. Robertshaw

W. H. Rudolph

L. B. Schiesz

E. J. Tucker

H. K. Wrench

C. H. Zachry

Nominating Committee Reports for 1947-1948

IN accordance with the provisions of Section 2, Article II of the Association's by-laws, the General Nominating Committee has submitted its nominations for officers and directors for the next fiscal year. In accordance with Section 3, Article II, any 50 member companies may make additional nominations on or before August 7.

Announcement is hereby made to the

membership of the report of the General Nominating Committee which will be presented at the annual convention in Cleveland, Ohio, October 6-8.

For President—Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, Pa.

For First Vice-President—Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs.

For Second Vice-President—Hugh H. Cuthrell, vice-president, The Brooklyn Union Gas Co., Brooklyn, N. Y.

For Treasurer—Edward F. Barrett, president, Long Island Lighting Co.

For Directors—two-year terms: Walter C. Beckjord, president, The Cincinnati Gas & Electric Co., Cincinnati.

Edward G. Boyer, manager of the Gas Department, Philadelphia Electric Co., Philadelphia, Pa.

Henry R. Cook, Jr., vice-president, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

Earl H. Eacker, vice-president, Boston Consolidated Gas Co., Boston.

Joseph N. Greene, president, Alabama Gas Co., Birmingham, Ala.

D. A. Hulcy, president, Lone Star Gas Co., Dallas, Texas.

Frederick A. Lydecker, vice-president, Public Service Electric & Gas Co., Newark, N. J.

James S. Moulton, vice-president and executive engineer, Pacific Gas & Electric Co., San Francisco, Calif.

Edward P. Noppel, general consultant, Ebasco Services Inc., N. Y.

John A. Robertshaw, president, Robertshaw Thermostat Co., Youngwood, Pa.

W. H. Rudolph, president, Savory Equipment, Inc., Newark.

Louis B. Schiesz, president, Indiana Gas & Water Co., Inc., Indianapolis.

Edward J. Tucker, director and general manager, Consumers Gas Co. of Toronto, Toronto, Ont.

Harry K. Wrench, president and general manager, Minneapolis Gas Light Co., Minneapolis.

C. H. Zachry, president, Southern Union Gas Co., Dallas, Texas.

Respectfully submitted, EDWARD G. BOYER, *Chairman,* J. H. COLLINS, E. M. FARNSWORTH, LEROY M. EDWARDS, BERNARD T. FRANCK and H. N. MALLON

The following have been nominated by Section Nominating Committees to serve as Section officers:

Laboratories Managing Committee: For Chairman—Arthur F. Bridge, vice-president and general manager, Southern Counties Gas Co., Los Angeles, Calif.

For Vice-Chairman—Charles E. Bennett, president, The Manufacturers Light & Heat Co., Pittsburgh, Pa.

Accounting Section: For Chairman—John A. Williams, controller, Niagara Hudson Power Corp., Syracuse.

For Vice-Chairman—Lester E. Reynolds, comptroller and ass't secretary, The Connecticut Light & Power Co., Hartford.

Industrial and Commercial Gas Section: For Chairman—Leon Ourusoff, manager of utilization, Washington Gas Light Co., Washington, D. C.

For Vice-Chairman—Bernard T. Franck, vice-president, Milwaukee Gas Light Co., Milwaukee, Wis.

Publicity Committee: For Chairman—R. G. Barnett, vice-president and general manager, Portland Gas & Coke Co., Portland, Ore.

Residential Gas Section: For Chairman—Chester S. Stackpole, manager, Merchandising & Domestic Sales, Consolidated Gas, Electric Light & Power Co. of Baltimore.

For Vice-Chairman—W. M. Jacobs, manager of general sales, Southern California Gas Co., Los Angeles.

Technical Section: For Chairman—Arthur C. Cherry, manager of Gas Distribution Department, Cincinnati Gas & Electric Co., Cincinnati.

For Vice-Chairman—S. J. Modzikowski, Chemical Testing Engineer, The Peoples Gas Light & Coke Co., Chicago.

Manufacturers Section: For Chairman—D. B. Stokes, vice-president, United States Pipe & Foundry Co., Burlington, N. J.

FOR CHAIRMEN →

A. F. Bridge
Laboratories Managing Committee

J. A. Williams
Accounting Section

Leon Ourusoff
Industrial & Commercial Gas Section

R. G. Barnett
Publicity Committee

C. S. Stackpole
Residential Gas Section

A. C. Cherry
Technical Section

D. B. Stokes
Manufacturers Section

FOR VICE-CHAIRMEN →

C. E. Bennett
Laboratories Managing Committee

L. E. Reynolds
Accounting Section

B. T. Franck
Industrial & Commercial Gas Section

W. M. Jacobs
Residential Gas Section

S. J. Modzikowski
Technical Section

Texas Town Awaiting New Citizen

Lone Star Gas Company stages full scale educational campaign with novel features prior to entry of natural gas service

BY BRUCE CUNNINGHAM, JR.

Lone Star Gas Co., Dallas, Texas

● The following account outlines a carefully planned educational program devised by Lone Star Gas Co., Dallas, "to assist the citizenship of Caldwell, Texas, to receive better gas service through new appliances and to discourage the purchase of second-hand and substandard equipment."

Employed by the company preliminary to serving the Texas community with natural gas for the first time, this method is radically different from the utility's customary procedure and should prove of interest to gas men in general.

WHEN Lone Star Gas Co. turns natural gas into its new distribution plant in Caldwell, Texas, late this summer, consumers will have a well-rounded knowledge of the company's 38 years of service and will be acquainted with gas appliances that bring maximum operating efficiency, comfort and economy. These advantages will accrue from an educational program promoted by means of a series of newspaper stories and advertisements well in advance of the arrival of natural gas service in Caldwell for the first time.

Premise of the educational campaign was "Gas service is no better than the appliances bringing the service." Company officials emphasize that the program was designed to encourage the public to buy good and dependable gas equipment even prior to the commencement of the new natural gas service.

A five-day gas appliance show to which all Caldwell householders were invited by mail was the climax of the campaign. Several hundred attended and showed lively interest in the advantages of modern gas appliances. The display automatically discouraged the purchase of second-hand and substandard gas equipment.

A joint presentation by the gas company and a group of local merchants, the show featured more than 25 pieces of gas equipment designed "for comfort, economy and service, and designed to bring more healthful living conditions to the home." Vented heating equipment was shown along with gas refrigerators, water heaters and ranges.

Trained personnel demonstrated and explained operations of the new gas appliances. Refreshments consisting of cookies and punch were served by Lone Star Gas Co. home economists. The cookies were baked in full view in a new gas range operated by butane.

Printed Matter

Recipe sheets, books on proper placement of gas appliances for maximum efficiency and service, and other printed matter of particular help to housewives in making homes more comfortable, were distributed. Home economists discussed food preparation and menu planning and offered suggestions on how to get the most economical use from gas appliances. Also supplied was information on production of balanced meals at minimum cost and counsel for home builders planning modern kitchens.

Housewives registering at the appliance display room demonstrated an almost unanimous desire for a cooking school, and as a result such a school is to be added to Lone Star's customer educational campaign in Caldwell.

A series of four newspaper stories was also part of the educational campaign. The first of these gave details of the early construction of the town's distribution plant, pointing out that, "Caldwell will have a natural gas supply supported by more than 1,000 wells in 60 widely scattered fields in Texas and Oklahoma, and a transmission system of more than 5,000 miles of pipe. This fuel has been a strong factor in the commercial and industrial expansion of towns and cities within Lone Star's territory" the story added, "and has also attracted many new residents to these communities because of its economy and convenience."

Another story slanted toward prospective purchasers of heating appliances, described the vented heating equipment to be displayed at the gas appliance show, stressing the health and comfort benefits which this equipment affords.

"Trained employees will show how to operate the modern new gas appliances for economy and efficiency," the story said, "and point out the advantages of heating the entire home with vented equipment to avoid sudden changes in temperature while going from room to room.

Other stories in the build-up for the gas appliance show generalized on the display and told about preparations being made by cooperating merchants and the utility.

Advertisements in the educational campaign carried a theme similar to the newspaper stories with the exception of one which was a frank discussion of rates to be set up in Caldwell.

The ad said, in part: "Lone Star service is recognized as one of the finest gas services, yet its cost per home customer averages less than 15 cents a day the year round. Caldwell will enjoy the same low rate as prevails in many other towns supplied by Lone Star. It is a 'sliding scale' rate with cost going down according to amount used. During winter when more gas is used for house heating, the cost is exceptionally low. . . . . We are pleased to be here and we want you to know we intend to do all we can to promote, just as any other good citizen, the best interests of Caldwell."

The company's officials strongly believe "this activity will pay dividends." Similar campaigns are being planned for other towns to be piped with natural gas in the near future.

Truth

● Truth is not the exclusive property of any one person. Nor is a truth expressible in only one set of words or one manner of delivery. That man who is so sure he is right that he dares blurt out his thoughts rough-shod, so to speak, needs Pope's reminder that "Blunt truths do more mischief than nice falsehoods do." Whoever has right and truth on his side has ample reason to be gracious and tactful in his words and manner. The possession of truth should make a man careful that he does it no violence.

—*C. W. Mears in* The Toastmaster

New Oil Gas Process

Buffalo utility uses twin generator oil gas method in actual operations to increase production capacity of high B.t.u. gas

BY R. J. CHAMBERS

Superintendent, Manufacturing Department, Iroquois Gas Corp., Buffalo, N. Y.

THE Iroquois Gas Corp. supplies natural gas to consumers in various villages and towns in Erie, Cattaraugus, Livingston and Wyoming Counties, and mixed gas to consumers in the cities of Buffalo, Lackawanna and adjacent villages and towns in Erie County.

In the City of Buffalo there are two mixing stations where natural gas and manufactured gases are mixed to maintain a 900 B.t.u. mixed gas having a specific gravity ranging from .55 to .66.

One of the mixing stations is located at the Bradley Street Works at the north end of the territory. On days of peak demand the supply of natural gas is insufficient. To augment supply one 12-foot x 11-foot x 11-foot water gas set was converted to high B.t.u. gas production in 1941, using coke generator fuel.

Men and Equipment

In a natural gas company the periods of manufactured gas production are irregular, uncertain, yet extremely vital. It is absolutely necessary to have dependable production equipment which can be operated by a minimum number of men.

At the present time the manpower necessary for fuel handling, fire cleaning, ash handling, etc., is supplied by other departments. Needless to say, the men assigned to this task are not happy, nor anxious to perform this kind of work. It is becoming more and more difficult to obtain new workers. "Everything would be satisfactory if fire cleaning could be eliminated" is the statement frequently heard.

Supplies of suitable generator fuel are undependable and difficult to obtain.

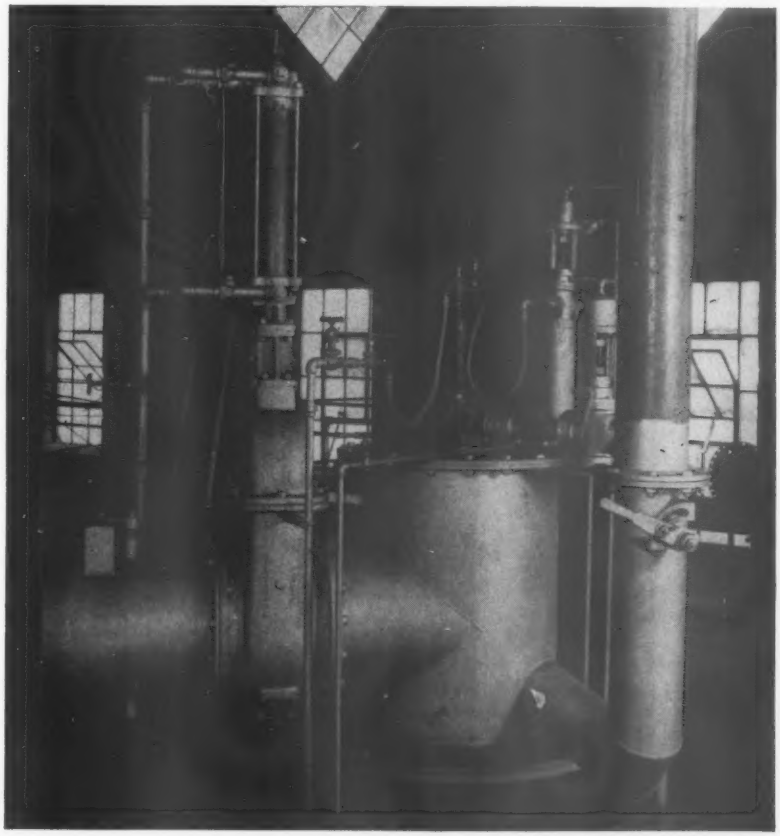
During early 1946 considerable study was given to the fire cleaning problem. The installation cost of automatic grates or an automatic generator appeared excessive for the few days production anticipated. On a cost basis oil could replace coke as generator fuel in a set producing high B.t.u. gas. It was thought there should be a process using oil to furnish the heat required for the set.

The Gas Machinery Co., Cleveland, Ohio, stated that they had a Twin Generator Oil Gas Process which would meet our specifications and produce twice the thermal yield obtained from the high B.t.u. set using coke as fuel.

Our preliminary investigation showed that we could expect to increase our production of high B.t.u. gas and eliminate the unpleasant job of fire cleaning. We agreed to proceed.

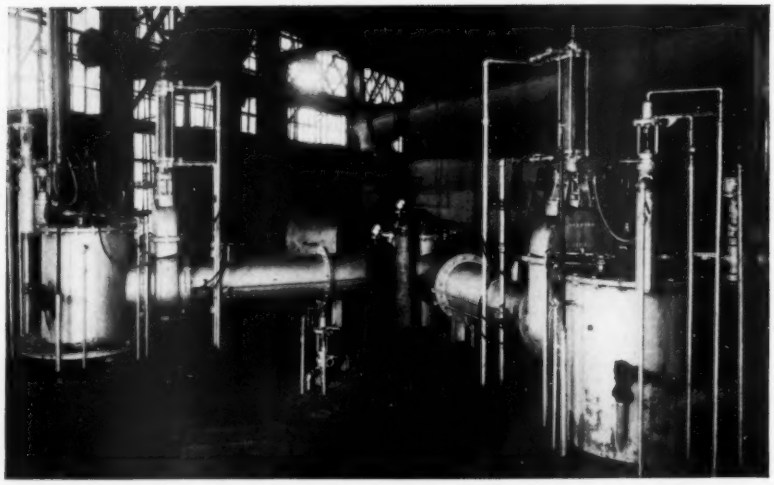
The grate was removed from the generator and a 48-inch diameter steel pipe installed connecting the bottom of the generator with the bottom of the carburetter. All steam and blast connections were removed, also the connection between the top of the generator and the top of the carburetter. Fire brick lining was installed in the base of the generator, the side walls were extended to the bottom, the new 48-inch connection was lined with one inch of insulating material and 4.5 inches of fire brick, and the cleaning doors bricked up. Fire brick arches were installed to support 12 courses of fireclay checkerbrick spaced 1.5 inches, staggered. Two thermocouples were installed near the top course of the checkerbrick, diametrically opposite each other.

A 30-inch x 20-inch steel Tee was installed on top nozzle of generator after removal of the charging door. A 16-inch air connection and an eight-inch steam



Tee atop generator, 16-inch blast, eight inch steam lines and heat oil burner

Presented at A. G. A. Production and Chemical Conference.



Tee on top of generator and top of carburettor and blast, steam and oil connections

View showing automatic control, oil meters, gauge board and pyrometer

connection were provided near the bottom of Tee to obtain a centrifugal motion. Steam, air, heat oil and make oil lines were equipped with the necessary meters, gauges, strainers and control equipment.

A special oil spray was installed at top of inlet Tee, so constructed that an oil burner can be inserted through a central passage.

The carburetter was arranged in duplicate of the generator.

No changes were made to the superheater or to the turbo-blower. The blower has a capacity of 23,000 cfm. at 36 inches static pressure. Some minor changes were made to the duplex oil pump to increase capacity.

A short piece of 36-inch pipe was removed from the top of the washbox and replaced with a section having three tangential water sprays.

One seven cam automatic control was installed.

The Twin Generator Oil Gas Process is achieved by rebuilding the generator and carburetter of a water gas set into two down heat and down make oil gas generators.

The two generators are first heated downward by the combustion of the heat oil—air and heat oil being admitted near the top of the generators—the superheater being heated upward by the products of combustion from the two generators. Oil gas is then generated in a superheated steam atmosphere in the top of the two generators, passes downward through the generators and is then reformed and fixed in passing up through the superheater.

Gas Production

The Twin Generator Oil Gas Process was officially started in operation on December 1, 1946. After preliminary preparations were made, the blast valves were opened and the Oxy-Acetylene ignition torches inserted into the generators to ignite the heat oil, then withdrawn. The heating period continued until the temperature at the top of the superheater recorded 1600° F. During the heating period, the operator can adjust the flow of heat oil by regulating a 0.5-inch valve and observing a Hays Veriflow Meter. The flow of air to each generator is adjusted by regulating a butterfly valve and observing an orifice meter.

The blast, heat oil and stack valves were then closed and make oil and process steam admitted to the two generators simultaneously, the gas produced passing through the washbox and condenser to the relief holder. A short steam purge is used to clean out the make oil sprays, and as a curtain for the blast purge. After several hand-operated runs, the automatic control was placed in operation.

During February 1947, when natural gas was distressingly needed, the twin

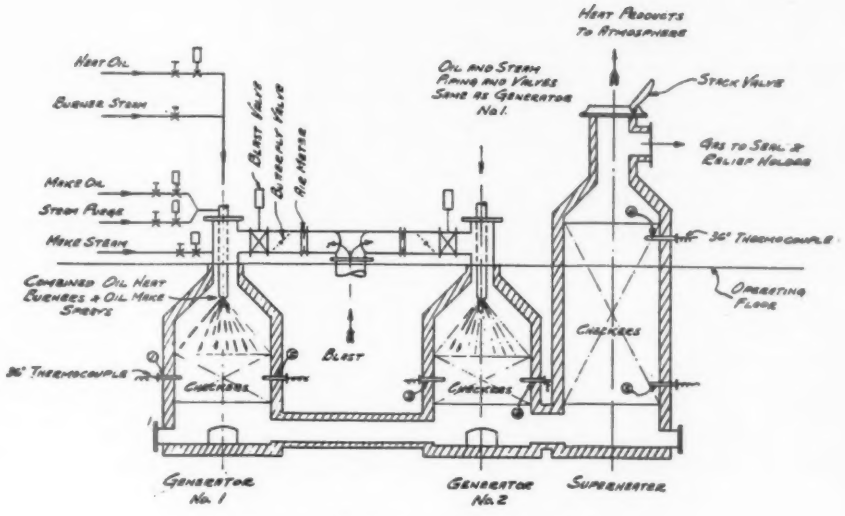


Diagram of Twin Generator Oil Gas Process

generator set operated, on one occasion, for 144 consecutive hours producing 250 to 275 M.c.f. of 950 B.t.u. gas per hour.

From the relief holder the gas passes to the exhauster then through the P & A tar extractor, shavings scrubber and purifying boxes to a 10,000 M.c.f. storage holder where it mixes with varying amounts of natural gas, carburetted water gas and coke oven gas.

The gas withdrawn from the storage holder passes through reciprocating, single stage compressors and is mixed with a supply of natural gas and manufactured gases at approximately 25 pounds pressure previous to entering the high pressure distribution system. The heating value of the mixed gas is controlled by a Cutler Hammer Calorimixer.

Conclusion

The Twin Generator Oil Gas Process eliminates the manpower required for handling generator fuel, cleaning fires, removing clinker and ashes, and can be operated by a minimum number of men. The operation of the set is relatively simple, clean and appealing to workmen. One visitor remarked, "A man could work this job wearing a tuxedo."

The gasmaker has "fingertip" control of the temperatures in the set and can thereby regulate the quality of the gas produced.

The production capacity of the original high B.t.u. gas set using coke as generator fuel was increased 100 percent by conversion to the Twin Generator Process, and a regular and more dependable source of supply attained.

Our operators say the set is now equivalent to a 6,000 M.c.f. per day natural gas well in our plant.

The results following are taken from actual operation, not from an experimental run. During the period December 1, 1946 to April 1, 1947 gas production was a necessity. *(Next page)*

OPERATING DATA

Cycle		
Blow	56.0%	136.6 secs.
Run	32.0%	78.1 secs.
Steam purge	5.0%	12.2 secs.
Blow purge	5.0%	12.2 secs.
Valve changes	2.0%	4.9 secs.
	100.0%	244.0 secs.

Quantities		
Heat oil to generator No. 1	4.0 gpm.	8.79 gals.
Make oil to generator No. 1	80.0 gals./run	80.0 gals.
Steam to generator No. 1	95.0 lbs./min.	143.0 lbs.
Air to generator No. 1	8400.0 cfm.	19,950 cu.ft.
Heat oil to generator No. 2	4.0 gpm.	8.79 gals.
Make oil to generator No. 2	80.0 gals./run	80.0 gals.
Steam to generator No. 2	95.0 lbs./min.	143.0 lbs.
Air to generator No. 2	8400.0 cfm.	19,950 cu.ft.

RESULTS FOR DECEMBER 1, 1946 TO APRIL 1, 1947

Hours, operating	2358	
Gas Made—M.C.F.	565702	
Make per Hour—M.C.F.	240	
Number of Runs	34827	
Make per Run—cu.ft.	16,242	
Heat Oil—gals.	704,017	1.24 gals./M.C.F.
Make Oil—gals.	5,099,657	9.01 gals./M.C.F.
Total Oil—gals.	5,803,674	10.25 gals./M.C.F.
Steam—lbs.	13,506,365	23.9 lbs./M.C.F.
Air—M.C.F.	1,209,675	2138 cu.ft./M.C.F.
Tar Produced—gals.	625,584	1.11 gals./M.C.F.
B.T.U.	960	

The Bradley Street Works is operated as a peak load plant, usually not more than 40 to 45 days per year. For the past three years production capacity has exceeded cooling and metering capacity, necessitating the use of the positive displacement exhauster to compute gas production until such time as a new meter can be purchased and installed.

The writer is of the opinion that the results shown are a conservative estimate of our operations.

HEAT OIL AND MAKE OIL ANALYSES

Test Number	1	2*	3
Specific Gravity at 60° F.	.855	.835	.785
A.P.I. Gravity at 60° F.	34	38	49
Viscosity, Say. Univ. at 100° F., Secs	—	36	—
Pour Point, °F.	Zero	Zero	Minus 15
Sulphur, % by Wt.	.30	.15	—
Carbon Residue, % by Wt.	.10	.02	—
B.t.u. per Gallon	139,623	137,400	132,400
Distillation			
Initial boiling point °F.	408.2	352.4	345.2
20 cc	480.0	454.8	388.4
40 cc	501.8	494.4	410.0
60 cc	534.0	523.5	435.2
80 cc	577.5	554.0	469.2
90 cc	602.6	579.2	489.2
end	647.2	636.8	534.2
Residuum	2.5%	1.5%	1.0%

* This type oil used most of the time.

GAS ANALYSES

Percent by Volume	*December*	*January*	*February*	*March*
CO_2	2.9	3.1	2.7	2.2
Ill.	27.1	27.6	29.0	17.9
O_2	2.9	2.8	3.2	0.9
CO	1.4	0.6	1.8	1.1
H_2	10.5	7.5	11.5	14.8
CH_4	31.0	34.1	31.4	41.0
C_2H_6	2.0	1.8	2.2	1.5
N_2	22.2	22.5	18.2	20.6
B.t.u. Thomas Cal.	980	995	1000	970
Sp. Gr.	.84	.86	.80	.82

HOURS OF OPERATION

	December	*January*	*February*	*March*	*Total*
Days Required	26	30	28	27	111
Hours Operation	495.3	667.4	638.1	557.7	2385.5
Lost Time—hrs.	17.0	12.6	6.6	11.0	47.2*
Total Hours	512.3	680	644.7	568.7	2405.7

* Time for changing shaving scrubber is not included.

CHECKERBRICK

The fireclay checkerbrick have not been changed since the beginning of operations, and now have slightly more than 2,400 hours of gas production.

MANPOWER PER DAY

1 Gasmaker	per shift	$\times 3 = 3$
1 Gasmaker's Helper	per shift	$\times 3 = 3$
1 Tar Operator	per shift	$\times 3 = 3$
1 Utility Man	per shift	$\times 3 = 3$
Total per day		12

TAR ANALYSIS

Water % by Volume	1.6
Specific Gravity at 77° F.	1.104
Insoluble in CS_2, % by Wt.	2.54
Viscosity, Specific, Engler 50 cc. at 40 C	3.8
Distillation to 170° C, % by wt.	0.0
170 to 235 C, % by wt.	6.6
235 to 270 C, % by wt.	18.3
270 to 300 C, % by wt.	11.1
Residuum % by wt.	64.0
Softening point (R & B) on residue °C	40.6

You Bet Your Life!

● The newcomer rubbed his head where it hurt most and looked around him. He felt terrible. A very old party with a flowing white beard shuffled toward him.

"What's the trouble, chum?" asked the old party.

The newcomer got to his feet. "I feel lousy," he said.

"That'll wear off" said the O.P. "You're just not used to this yet. Come over here and give me a hand."

The newcomer followed dutifully. "Look," said the bearded one at last, "they expect me to keep track of all this stuff." He indicated the mountain of paper piled bale on bale around them. Booklets, posters and mimeographed sheets fluttered about like snow in the gentle breeze.

"I don't get it" said the newcomer. "What is all this, anyway?"

"Safety stuff" said the old party. "I try to keep track of it but more comes in every day. This kind of thing." He picked up a brightly printed pamphlet and handed it to the newcomer. In attractive graphs and charts it gave the statistics on automobile fatalities in the United States for the year 1945. "Almost two years old and I ain't got it filed yet," said the old man sadly.

"How come you get all this stuff?" asked the newcomer.

"Don't rightly know" replied the old party. "Seemed like a good idea once, but it kinda got out of hand. There's some mighty fine readin' here, though. Take yourself, f'rinstance. You might wanta know how many people got theirselves killed last year passin' other cars on hills and blind curves."

"I'm not interested" snapped the newcomer. . . . .

"I got a dandy piece in here somewheres about first aid for motor vehicle victims. What to do about a broken neck. . . . . How to stop the flow of blood. . . . . It's downright fascinatin'."

"Why don't you go boil your head?" inquired the newcomer.

"No offense intended" said the old party. "Just makin' conversation. By the way, didn't you never read any of this here material on safe drivin'? Stuff about passin' on hills and curves, gettin' impatient and drivin' too fast in traffic, all like that there?"

"Listen to me, you dismal old goat," snarled the newcomer, "I feel bad enough right now as it is. I don't need you to preach at me."

"Don't get your collar hot, sonny, said the dotard mildly. "I was just askin'." He shifted his scythe to the other hand and peered outward. "Anyways," he went on, "it's your funeral. And by a odd coincidence they're havin' it right now. Wanta watch?"—*Union Electric News.*

* A new booklet on safe driving called "You Bet Your Life" is now being distributed by the Travellers Insurance Companies of Hartford, Connecticut.

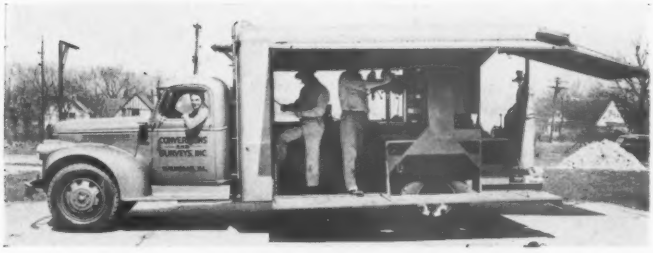
North Shore Goes "Natural"

Illinois utility speeds changeover with everything from jeep to portable shop

I HAVE dreamed of these valves for five years," sighed A. W. Conover, president, North Shore Gas Co., Waukegan, just before natural gas was turned on for 30,000 customers in northeastern Illinois. With Mr. Conover were C. J. Mulholland, secretary-treasurer, and William Wuestenfeld, general superintendent of distribution (top photo at right).

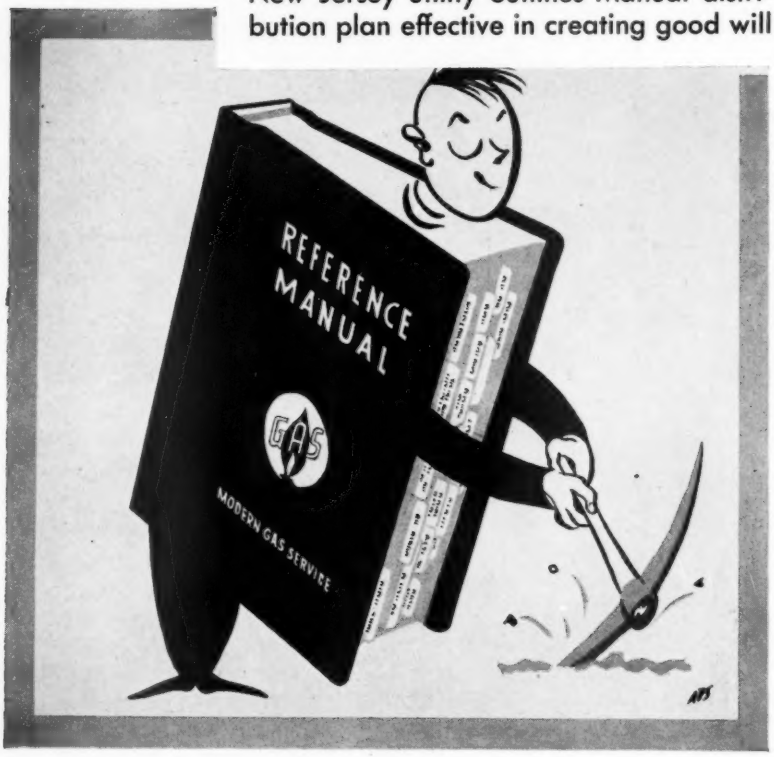
During the changeover from manufactured to natural gas an $8 million portable shop was used to service 200 appliance adjusters (side and rear views shown at right). A new jeep ditcher proved invaluable, digging ditches up to 300 feet an hour (see above).

Numerous improvements were made. An attractive window display stressed the theme, "It's the flame that makes it perfect." The utility's Libertyville office and store were remodeled (lower right) and a cashier's desk added of original design that has proved popular with customers and cashier alike. Above the door a sign announces "Natural Gas Will Soon Be Here."



Put It To Work

New Jersey utility outlines Manual distribution plan effective in creating good will



● Approximately 10,000 copies of the Reference Manual of Modern Gas Service have been purchased by the gas industry—sure sign of the industry's confidence in the Manual's ability to build gas load and improve installation practices.

Gas utilities have reported to the American Gas Association a number of interesting and successful plans on the use and distribution procedure of the Manuals. The writer, however, is most familiar with the plan adopted by Public Service Electric & Gas Co., Newark, N. J., which he has outlined below.

BY H. P. MOREHOUSE[1]

Chairman, Committee on Housing, Residential Gas Section, American Gas Association

THIS company purchased 1,800 Reference Manuals for distribution to its architects, builders, finance institutions and others—a rather liberal use as may be observed from the accompanying distribution list. The criteria followed regardless of the business classification was: Will the Manual be used to good advantage by this party or organization to help promote gas? If the answer was "yes," the investment was considered by the company to be sound.

Personnel Selection and Training

To fully utilize the possibilities of the Reference Manual, its presentation and distribution must be handled most carefully. This involves proper selection and training of personnel. Public Service selected men for the job who were already accustomed to call on architects and builders through their former activities in the gas heating department.

Fifteen of these men were given a two months' course, two days a week. The Reference Manual was used as the text to make certain that the men had a complete knowledge of all gas services in the home, were thoroughly familiar with everything in the Manual and knew where to find information quickly.

The company was particularly fortunate in being able to obtain as instructors for the course most of the authors of the various chapters. The Manual was thoroughly reviewed page by page—the text material on selecting, sizing and installing, the architect's installation specifications and the manufacturer's appliance data sheets. In addition, several inspirational speakers were called in to give talks on the future possibilities of the gas industry.

Students remained alert throughout the course and took copious notes due to the knowledge that they would be required to take a three-day final examination consisting of 72 questions.

Trained in Presentation Procedure

As part of the course the architect, builder and dealer representatives were instructed how to present the Reference Manual to the recipient. First step is to mail a letter, enclosing a small descriptive folder which reviews the volume's purpose and scope. The letter also states that a representative will call in the near future to present a Manual in person. The next contact is a phone call for an appointment allowing adequate time to highlight important points.

Presentations vary with the type of recipient. For example, with an architect the emphasis might be placed on kitchen planning and all-year air conditioning—two subjects of current interest to architects. With a builder, the emphasis might be made on ranges, water heaters, house heaters or laundries. With home economics instructors in schools, kitchen planning and gas cooking may be of chief interest.

This original call on the recipient offers an unusual opportunity. The architect or builder, for example, is in a receptive mood toward gas because he is being presented gratis a complete volume on the selection, sizing and installation of all gas equipment in the home. This volume will answer most of his questions, making it unnecessary in many cases to call the gas company or to cull an assortment of manufacturers' literature to get the information needed—information which may often be buried in advertising copy.

The orginal presentation is the all-im-

[1] Assistant sales manager for gas, Public Service Electric & Gas Co., Newark, N. J.

portant call. It is an excellent opportunity to prepare the foundation for future productive calls at which time additional information will be added to the Reference Manual. This privilege of a call-back with a welcome, a purpose and a service, is an opportunity unexcelled.

Personalized Copies

A printed title page is inserted under the front cover of the Manual and carries a dedication statement, the recipient's name and the name of the architect, builder and dealer's representative who will serve him in the future.

With the wide distribution followed by this company, the task of keeping the publication up-to-date with the 150 or more Manufacturers' Appliance Data Sheets becomes a big problem as well as a big opportunity. Consequently, it has been found necessary to keep an individual record on each Manual.

Each record is numbered and thus identified with the recipient. Individual follow-up cards are also prepared for each volume delivered, listing the recipient's name, address, profession or business and the date of presentation. The back of the card is ruled to record servicing dates and the exact material which was added on each call. Without such a follow-up record it would obviously be impossible to keep all Manuals up-to-date.

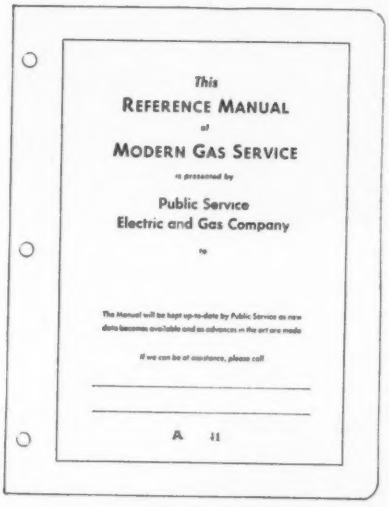
Acts as Approval List

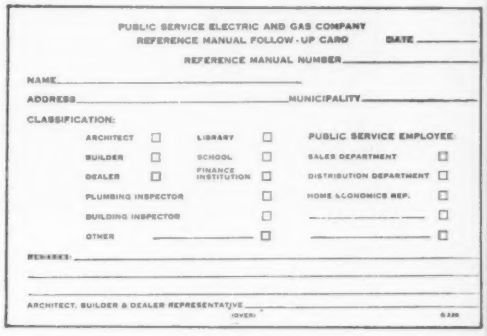
Not every manufacturer's data sheet is included. Excluded are sheets for those manufacturers who do not promote or have no dealer representation in the districts served; those whose equipment has been found unsatisfactory or has not been sufficiently proven. The company's procedure with regard to central heating equipment will best illustrate the point.

Under Public Service's Minimum Standards Plan for central gas heating installations, all equipment in addition to having A. G. A. approval must be tested and passed by the utility's testing laboratory. Manufacturers whose equipment has been rejected, or is untested, will not have their Appliance Data Sheets in the Manual. Thus the Reference Manual automatically becomes the gas company's "approved" list. It becomes unnecessary for the user to ask the gas company whether or not the heater or conversion burner under con-

PLANNED DISTRIBUTION OF REFERENCE MANUAL

	Number
ARCHITECTS	263
BUILDERS	296
FINANCE INSTITUTIONS	88
PREFABRICATORS	11
GOVERNMENTAL HOUSING AGENCIES	7
KITCHEN MODERNIZING CONTRACTORS	40
MUNICIPAL BUILDING INSPECTORS	90
MUNICIPAL PLUMBING INSPECTORS	78
ACTIVE GAS MERCHANDISING DEALERS	120
SELECTED PLUMBING AND HEATING CONTRACTORS	192
COLLEGE HOME ECONOMICS DEPARTMENTS	10
HIGH SCHOOL HOME ECONOMICS DEPARTMENTS	160
SELECTED PUBLIC LIBRARIES	60
GAS COMPANY PERSONNEL (KEY SALES PERSONNEL, HOME SERVICE, HEATING DEPARTMENT REPRESENTATIVES AND KEY DISTRIBUTION DEPARTMENT REPRESENTATIVES)	96
UNASSIGNED (RESERVED FOR FUTURE NEEDS)	289
	1800





A printed title page (left) is inserted under the front cover of each Manual and carries a dedication statement, recipient's name and name of representative who will serve him. A follow-up card like the one reproduced above is prepared for every volume delivered

Carl Kemm Loven, New Jersey architect, reviewing copy of Reference Manual as it was presented by gas company representative Edwin C. Vanderhoven, left

sideration is acceptable for meter set and their free service policy. This also acts as a stimulus to all manufacturers to cooperate in making sheets available for the Manual.

The liberal use of this reference volume in putting an approved equipment list into the hands of those who specify and install gas appliances can be a valuable aid in keeping out undesirable appliances.

Public Service has not completed its distribution as considerable time is required even for 15 men to deliver, personally, 1,800 Manuals by appointment and review the contents. Those volumes which have been delivered have been enthusiastically received. In a number of cases the architect, for example, has heard of the Manual and called to inquire when he would get his copy. This gas utility feels it is building a tremendous amount of good will, is helping to promote gas for all services and is reducing its installation and service troubles.

Architects' and builders' group at Public Service Electric & Gas Company. H. P. Morehouse and J. P. Leinroth, gas sales heads, center row, third from right and far right

Huge Need for Automatic Gas Ranges Predicted During Next Five Years

GAS appliance manufacturers and dealers look forward to the greatest sales volume in their history in the next ten years according to D. P. O'Keefe, president, Gas Appliance Manufacturers Association.

With 22.9 million homes in the United States alone using gas for cooking, it is estimated, Mr. O'Keefe said, that potential demand for gas ranges in the United States and Canada may exceed 25 million units in the next five years. More than ten million gas ranges now in use are more than ten years old, he added, and an additional eight million now in use will attain that age during the next five years and be ready for replacement by new up-to-date models.

More than 12.2 million homes in the United States are using gas for automatic water heating and manufacturers are expected to exceed 1941 production by 1.2 million, producing two million units in 1947.

Despite the war period, which curtailed home building and main extensions, the number of homes using gas for cooking increased 46 per cent in the past ten years. Of the 7.2 million new gas cooking customers added since 1936, approximately four million were added to gas utility lines and 3.2 million through LP-gas distribution.

While it is impossible to estimate the number of new residences which will be built in the near future, the industry confidently expects a minimum of 1,250,000 new homes to use gas for cooking each year. When supplies of materials allow doubling and extension of existing pipelines, building of new pipelines, the expansion of manufactured gas production facilities, development of additional LP-gas distribution outlets and new home building in volume, the gas industry expects to add new customers at a substantially greater rate.

Confronted with shortages of materials which prevented full use of expanded production facilities, gas appliance manufacturers see new hope of catching up with current demand in 1947.

Already the gas industry is planning to capitalize on U. S. and Canadian demand for new gas ranges with a three-month promotional campaign in the fall on the theme "Gas Has Got It." The American Gas Association expects to use 9 million magazine impressions on the advantages of automatic gas ranges built to "CP" standards. To tie into this enlarged program, range manufacturers plan to increase national, local and trade space schedules and issue special dealer helps which will introduce the first new gas range lines brought out since the start of the war. Special local newspaper campaigns and promotions by gas utilities to aid dealers will make this the largest unified three-month promotion in the 125-year history of the gas industry.

Purification Research In Holland

THE American Gas Association has received one of a series of monographs on the progress of research in Holland during the last war entitled, "The Wet Purification of Coal Gas and Similar Gases by the Staatsmijnen Otto-Process." The authors are H. A. J. Pieters and D. W. van Krevelen.

In this process hydrogen sulfide is removed from gas by scrubbing with a suspension of prussian blue in dilute ammonia. The ammonia solution also contains a certain amount of ammonium salts to stabilize the blue and buffer the alkalinity which is influenced by the ammonia in the gas. The spent solution is regenerated by treatment with compressed air, resulting in the dissolved hydrogen sulfide being oxidized to a recoverable sulfur. The suspended blue acts as an oxygen carrier. Hydrogen cyanide in the gas is removed as ammonium sulfocyanate.

The authors claim a quantitative removal of hydrogen sulfide from the gas recovered as elementary sulfur. Soluble impurities are removed from the sulfur for the most part by filtering and washing. Pure sulfur can be made by heating and distillation.

A discussion of the constitution and properties of iron cyanide complex as oxygen carrier, general principles of gas absorption, the absorption velocity of hydrogen sulfide, the oxidation velocity of absorbed hydrogen sulfide and certain secondary reactions completes the paper.

Illinois Bulletin Discusses Foremen's Unions

IS the foreman a part of management? Does foreman unionism threaten a breakdown of management? Can a unionized foreman effectively carry out managerial policies? Will the unionized foreman help to increase or decrease production? What is the relationship between the rank-and-file labor movement and foremen's unions? Why have the foremen unionized?

These and other timely questions are discussed in a University of Illinois Bulletin by J. Carl Cabe entitled "Foremen's Unions: A New Development in Industrial relations."

Well-Head Price Fixing

"Commerce Clause" of the Constitution might prove most formidable obstacle to any state scheme to fix well-head gas prices

BY GLENN CLARK

Vice-President and General Counsel, Cities Service Gas Co., Oklahoma City, Oklahoma

RECENTLY the Corporation Commission of the State of Oklahoma issued two orders[1] fixing the price of natural gas at the well-head. One of these orders (Number 19514) is legislative in character and, if valid, will affect every producer of natural gas in the Oklahoma portion of the Hugoton field. It requires "That no natural gas shall be taken out of the producing structures or formations in the Guymon-Hugoton field in Texas County, Oklahoma, at a price at the well-head of less than seven cents per thousand cubic feet of natural gas, measured at a pressure of 14.65 pounds absolute pressure per square inch."

The going field price at the well-head in the Guymon-Hugoton field is approximately four cents per thousand cubic feet of gas and the effect of these orders, if valid, will be to increase that price, on the basis of measurement now generally in use, to approximately seven and eighty-four hundredths cents per thousand cubic feet.

The legal questions, both state and federal, embraced within the Oklahoma orders, are numerous and are in issue in legal proceedings in which my company and others now are engaged to test the validity of those orders. Therefore, it would ill-behoove me to treat specifically with those particular orders or to assume a legalistic or dogmatic attitude with respect to those legal questions. Specific reference to these orders has been made by me only because of their precedent making possibilities and because of the wide interest they have created. I will deal with my subject in a more general way, from the standpoint of fundamentals as I view them, and will speculate briefly on some of the problems which might attend state endeavors to fix well-head gas prices.

Except with respect to a limited field, such as that occupied by public utilities, nationwide interest has attended every attempt of a state to fix the price at which a commodity or service may be sold. This interest, I think, springs from a basic concept of legal limitations on price fixing which has been engendered within us over a long period of years, but the foundations of which largely have been obliterated during a very short period of time.

The police power of a state is the power of sovereignty, the power to govern men and things within its dominion. It is by virtue of this police power that a state may legislate to fix prices. The exercise of every private right will in some manner affect the public, and conversely, the exercise of the police power of a state must to some extent abridge the liberty or affect the property of a citizen. Subject to constitutional restraints, the private right must yield to the public need. The Fourteenth Amendment of the Constitution does by no means stand as an absolute barrier against price fixing by a state. The extent of its restraint always is a puzzling question because it varies in final analysis with changing interpretations by the Supreme Court of the United States.

I think most of us have believed and rightly so, until recent years, that the power of a state to fix the price of a commodity or service is limited far more drastically by constitutional provisions, both state and federal, than now appears to be the case.

We have recognized it to be axiomatic that commercial price or market value is the essence of property and that whatever takes away or reduces that price, or reduces the bargain of a purchaser under a contract, which is property, takes away to the extent of the reduction the property the owner theretofore has had. Moreover, in the Court decisions of earlier days we were taught that the Constitution must be interpreted in the light of generic common law rights, including the right to enjoy and use private property in any manner which will not injure the lawful rights of another.

Special Cases

Under the common law, certain businesses were regulated by the Government because they were "clothed with a public interest." These businesses were such as operated under circumstances constituting them virtual monopolies or under charters granting exclusive privileges, or were the traditional businesses that people in the ordinary course of necessary business or preservation of life or health had to patronize.

It always has been difficult for the Courts to lay down a working rule by

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Presented at American Gas Association Natural Gas Spring Meeting, Chicago, April 30-May 1.

[1] Peerless Oil and Gas Co. v. Cities Service Gas Co. and all Operators, Producers and Takers of Natural Gas in the State of Oklahoma, and particularly in the Guymon-Hugoton Field. Cause C.D. No. 1054, Order No. 19514. Peerless Oil and Gas Co. v. Cities Service Gas Co., Cause C.D. No. 1054, Order No. 19515.

which it may readily be determined when a business has become affected with a public interest, but for many years they have interpreted the Fourteenth Amendment as prohibiting state price fixing of commodities or services in the ordinary business activities of mankind. This type of regulation has been limited rather strictly to types of industry with attributes similar to those inhering in those industries which, under the common law, were held to be affected with a public interest. One of the earlier leading cases respecting price fixing by a state is that of Munn v. Illinois,[2] decided in 1877. There it was held by the Supreme Court of the United States that the State of Illinois could regulate the charge of an elevator standing in the throat of commerce and taking toll from all the commerce that passed from the west to the east, a virtual monopoly that had published its rates to the public.

In 1923 Chief Justice Taft, speaking for the Supreme Court, laid down three classes of business said to be clothed with a public interest justifying some public regulation.[3] These classes were (1) those carried on under a public grant of privileges; (2) certain occupations regarded as exceptional, such as the keeping of inns, cabs and gristmills; and (3) business, the owner of which, by devoting it to public use, in effect grants the public an interest in that use and subjects himself to public regulation to the extent of that interest. Further, the Chief Justice stated:

"It has never been supposed, since the adoption of the Constitution, that the business of the butcher, or the baker, the tailor, the woodchopper, the mining operator or the miner was clothed with such a public interest that the price of his product or his services could be fixed by state regulation."

This philosophy continued practically unbroken until the case of Nebbia v. New York,[4] decided in 1934, in which the Court, in a five-four decision, held that price fixing of milk by a statute of New York was not unconstitutional where, in the absence of such a law, the paramount milk industry of the State of New York would be drastically impaired and the quality of milk endangered.

Had that decision been bottomed primarily upon the preservation of the public health, or had the Supreme Court adhered to the long accepted interpretation of the case of Munn v. Illinois, there would have been nothing novel in the conclusion reached. But the primary justification for the state legislation there in question appears to have been economic necessity arising from an overabundance of milk and consequent destructive competition between milk dealers. And the Court not only held in substance that there is nothing sacrosanct about the price one may charge for what he makes or sells, but also that the phrase "effected with the public interest" can mean no more than that an industry for adequate reason is subject to control for the public good.

Since the Nebbia case, there have been several instances of price and wage fixing outside the field in which most of us thought that expedient validity could be exercised. In 1941, in a unanimous decision,[5] the Supreme Court upheld a Nebraska statute fixing the maximum compensation which a private employment agency may collect from an applicant for employment. In that case, Justice Douglas, speaking for the Court, said:

"In final analysis, the only constitutional prohibitions or restraints which respondents have suggested for the invalidation of this legislation are those notions of public policy embedded in earlier decisions of this Court but which, as Mr. Justice Holmes long admonished, should not be read into the Constitution."

He stated further:

"We are not concerned, however, with the wisdom, need, or appropriateness of the legislation. Differences of opinion on that score suggest a choice which 'should be left where . . . it was left by the Constitution—to the States and to Congress.'"

I suppose most of us believe that there should be some elasticity in the law, at least to an extent which does no violence to fundamental principles. And certainly with an ever-expanding and complicated economy, it becomes more and more difficult to draw the line between a business which is affected with a public interest and one which is not.

Under the present state of the decisions, absent conflict with specific constitutional provisions such as the commerce clause, there would seem to be

[2] 24 L. ed. 77; S.C. Rep. ed. 113-154.
[3] Chas. Wolff Packing Co. v. Court of Industrial Relations of the State of Kansas, 262 U. S. 522; 67 L. ed. 1103.
[4] 291 U.S. 502, 78 L. ed. 940.
[5] O. M. Olsen v. State of Nebraska, et. al., 313 U.S. 236, 85 L. ed. 1305.

COPY CAPSULES

BY HAL STEBBINS

Executive Vice-President, Honig-Cooper Co., Los Angeles

1. Facts First! You've got to know before you go.

2. The longer I live the more respect I have for the obvious. Often the best appeal is the obvious one—timed right and done *heroically*.

3. Eternal Triangle: Say it well. Say it fast. Say it often.

4. Advertising is taking an idea from the back of my head and putting it in the back of your head.

5. A good director doesn't fill his footage with entrances and exits. He does his cutting while he's shooting. A good copywriter does the same.

6. My favorite foursome! Be brief without being curt. Be bright without being smart. Say your say. Know when to stop.

7. The Latins may be lousy lovers but they have an excellent definition of good copy: *multum in parvo*.

8. Your advertisement should be liked by the reader—not loved. If he likes it, he will like what you're selling—and buy. If he loves it, he will become enamoured of what you're *saying* and forget what you're *selling*.

9. All a good copyman needs to know—how to serve the Truth with mental mayonnaise.

10. An advertising man's mind should be like the back of a linotype machine. It should *automatically* select the word that fits.

11. Take away the roast beef from advertising and you steal its substance—its bone, its sinew, its marrow. Dress it in superfine clothes—powder it, pamper it, and you rob it of its virile inheritance.

12. The best copy doesn't spring from the typewriter; it springs from the heart.

—Reprinted from Printer's Ink

no lack of inherent power in a state to fix well-head gas prices merely because the gas producing industry is not one which we have thought to be affected with a public interest. Of course there must be adequate reason for invoking the police power. Moreover, the legislative act must be reasonably related to and designed to accomplish the declared purposes. At least, that has been the declared law over a long period of years. In some recent cases, however, the presumptions in favor of state action have been so conclusive both as to the adequacy of the reason for exercising the police power and as to the appropriateness of the price fixing remedy, that the question of how a Court determines whether or not state legislation is so arbitrary or discriminatory as to violate the "due process" clause of the Fourteenth Amendment is a perplexing one.

Presumably, however, in attempting to give validity to well-head price fixing, a state legislature must find in some way that correlative rights of gas producers and royalty owners are not being protected or that waste of gas is occurring or some other reason deemed adequate to require additional control of the gas production business for the public good rather than for the benefit of one small group at the expense of another. If such reason is adequate, the fixing of the well-head price should be reasonably calculated to prevent or reduce the evils which are thought to cause public injury.

Whether such evils exist in any of the gas producing fields of this nation, and if so, whether the fixing of some higher or lower price than that established by the time-honored law of supply and demand would alleviate the condition, are questions concerning which your knowledge or guess, as the case may be, is as good as mine.

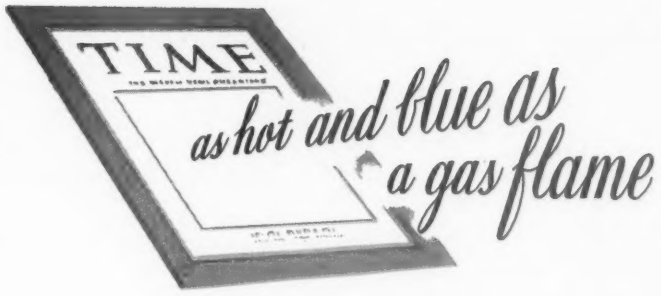
The "commerce clause" of the Constitution might prove to be the most formidable obstacle to any state scheme to fix well-head gas prices. In most of the large dry gas fields of this nation the bulk of the gas produced is sold to interstate pipeline companies. In the daily and normal course of events, this gas in many if not in most instances, is on its uninterrupted journey for delivery in other states from the moment it is taken from the well-head, or for that matter, from the producing formations. Although there are differences of opinion concerning the matter, there is no dearth of authority to the effect that the first sale of such gas, whether at the well-head or at the facilities of the pipeline company, is a sale in interstate commerce.

If the sale is in interstate commerce, it may or may not be subject to the rate regulatory powers of the Federal Power Commission, depending upon the scope of the exemption provisions of Section 1(b) of the Natural Gas Act. The forthcoming decision of the Supreme Court of the United States in the Interstate Natural Gas Company case should further clarify the status of field sales of gas for out of state delivery. If these are held to be sales in interstate commerce, the scope of the production and gathering exemption of the Natural Gas Act might at long last be defined.

But if such field sales actually are made in interstate commerce, a holding that they are exempt from regulation by Federal Power Commission would not necessarily clear the way for state control of field prices. Federal delay or inaction in occupying a field of interstate commerce requiring uniformity of treatment does not open the door to state regulation.

In any event, it may be credibly assumed that well-head price fixing of natural gas by a state could cause extreme difficulty in the gas rate regulatory fields of other states and of the Federal Power Commission. Conceivably, the price of gas to pipeline companies and to ultimate consumers would depend constantly upon sporadic changes in well-head prices.

It is not for me to pass upon the wisdom of any state pricing of well-head gas that validly may be accomplished. However, in conclusion, I suppose it is not inappropriate for me to observe that since gas consumers far outnumber gas producers and royalty owners, the states which attempt well-head price fixing may be inviting federal control, or perhaps I should say the extension thereof, of well-head gas prices.



THE magazine *Time* of June 2 carries a cover story on Impresario Billy Rose, mentioning various people whom the inimitable Billy had started fameward. "In 1924 . . .," says *Time*, "Billy hired a chorus girl with a voice *as hot and blue as a gas flame*—Helen Morgan." *Time's* penchant for apt and accurate adjectives, in this instance, couldn't be more applicable.

Other national magazines have published excellent stories on gas equipment using illustrations of cooking, kitchens, refrigeration and heating in both color and black and white.

To cover the complete story of gas ranges, *Good Housekeeping* for June wound up its trilogy of stories on oven and range top with "Know Your Range, the Broiler," using seven illustrations and several tested broiler recipes. The same issue printed a three-quarter page picture of a lush-looking beef being taken out of an open gas range oven.

Better Food (now incorporated in *Practical Home Economics*), in its May issue described the New York City High School Lunch Program, using as illustration a picture of a typical high school kitchen equipped with a gas range.

Tide magazine's May 2 issue reported the distribution and advertising programs of Incinor and Calcinator gas garbage disposal units. The same issue carried a business-like report of the Gas Appliance Manufacturers Association meeting in April and also detailed G.A.M.A.'s promotion and advertising plans.

Small Homes Guide, in its eighteenth edition, thoroughly covers the choice of kitchens available to the homemaker and uses two pictures of New Freedom Gas Kitchens. The same magazine's Spring-Summer issue covered "Basic Types from Which to Select Your Heating System and Equipment," mentioning gas equipment.

"Kitchen Problems with Pretty Answers,"

(Continued on page 376)

Community Cooking Schools

Baltimore Home Service Bureau finds project helps improve public relations, creates desire for new type appliances

BY MARGARET E. HOLLOWAY

Director, Home Service Bureau, Consolidated Gas, Electric Light and Power Co. of Baltimore

● Following is a discussion of the neighborhood cooking schools which Chester S. Stackpole, vice-chairman, Residential Gas Section, American Gas Association, feels is a most important activity of the Home Service Department at the Consolidated Gas, Electric Light & Power Co. of Baltimore.

THE Home Service Bureau of the Consolidated Gas, Electric Light & Power Co. of Baltimore was started in 1930 and for the first two years limited its demonstrations to Bureau Kitchens and individual demonstrations of appliances in the home. When it became apparent that the average housewife was not being reached, we hit upon the idea of renting a vacant building such as a hall or store and inviting the housewives in the immediate vicinity to a series of cooking schools. These schools were an immediate success and with the exception of the four war years, have been in continuous operation ever since.

The demand for business space became so great following the depression that we were forced to turn to church halls and Sunday School rooms, a practice which we have continued to date.

A special contact man or investigator has been designated in the Home Service Department to reach the various women's organizations of the churches and arrange for a cooking school. Usually the church is given $25 for the use of the room and is credited with the entire amount of gas and electricity used during the school period.

We soon found that women's organizations from all over the city were ready to request these schools and consequently very little canvassing work was necessary. Schools are spotted throughout the entire area to cover the greatest number of people. Only on rare occasions is a repeat session held on the same location within two years. First of all, our investigator lines up the schools from four to six weeks in advance to enable the office to run off invitation cards for families living within the area. Meter reading handbooks are very helpful in this operation and usually anywhere from 2,000 to 4,000 invitation cards are mailed on each occasion.

Housewives at gas company's neighborhood cooking school see latest recipes in action

New housing developments are given due consideration and wherever possible a school is placed within the locality as soon as possible. Schools are held from 2 to 4 p.m. Monday through Friday of the first week and Monday through Thursday of the second week. During this two-week period an evening meeting is held from 7:30 to 9:30 p.m. for women who work during the day. Daily attendance at afternoon meetings averages around 75 persons with highest attendance running to 140. Attendance at the night classes averages approximately 75 with a high of 120.

Equipment consists of a sectional platform, two gas ranges, a gas refrigerator, an electric refrigerator, kitchen cabinets, two work tables, two three-way floor lamps, a lapel microphone, amplifying equipment and miscellaneous small appliances, as well as pots, pans, utensils and dishes. The Home Service Bureau has a supply of folding chairs which can be used on short notice.

As soon as the investigator, Home Service demonstrator and committee have reached the cooking station and placed a sign in front of the church calling attention to the school, supplies are purchased from the neighborhood grocer for the day's cooking operations.

Schools are moved on Friday of the second week with the investigator making all arrangements for transportation and supervising the moving and reinstallation. He also plans the equipment location in the room so that appliances can be shown off to their best advantage. On the morning of the first day of school the Home Service demonstrator checks operation of the ranges with a member of the service department to insure maximum efficiency. Each range is also given a preliminary baking test before class is opened. The Home Service director officiates at the grand opening where she welcomes the guests, acquaints them with the purposes of the school and explains the activities of the Home Service Bureau. She also introduces the instructors and stresses the fact that the schools are purely noncommercial and completely apart from the sale of appliances. At this point the Home Service demonstrator takes over.

We have arranged our programs so that they operate on a schedule but are sufficiently flexible to include requests.

Following are some of the subjects covered: Yeast bread making; work with sugar substitutes, meat substitutes, meat stretchers, economy meals and party suggestions; the seven basic principles of nutrition; cooking on all parts of the range, use of the refrigerator and appliances; standard level measurements and proper mixing procedures.

Additional *(Continued on page 376)*

Bimetallic Thermal Element Study

Research indicates that maximum spot temperature attained on bimetal strip rather than average temperature is major factor affecting performance characteristics

BY H. J. HENSE and A. A. KAMPMAN

American Gas Association Testing Laboratories

IN keeping with the increasing popularity and use of automatic gas controls, fundamental data on operating conditions under which bimetallic thermal elements are called upon to perform have been compiled under the supervision of the Technical Advisory Group for Domestic Gas Water Heating Research.

Basic research on flat strip bimetallic thermal elements, sponsored by the Committee on Domestic Gas Research, was conducted at the Laboratories and points the way to improved designs of bimetallic type controls. Results of the study are found in Research Bulletin Number 42, "A Study of Bimetallic Thermal Elements," published by the Laboratories as a component part of Project DGR-1-WH.

Field Conditions

Constituting initial work closely allied to the control field, it was found that operating conditions in service are frequently more severe than those assumed. It appears that more accurate information on field conditions for specific applications would result in improved performance. The study thus opens a possible new approach to metallurgical concepts of how a specific bimetal will perform in that it was found that field conditions differ appreciably from those imposed in uniform heating of bimetal elements commonly employed in stress analyses.

Composition and recommended working temperatures of bimetal samples used in the study, as obtained from bimetallic element manufacturers, are given in the accompanying table.

In the development of factors affecting bimetal performance a wide variation in the temperature readings was observed at three different points along the test strips. Temperature differences as great as 600 F were found in some instances. It became obvious from these studies that bimetals do not approach an evenly heated condition in many applications of contemporary safety devices. Thus it was found that average temperatures should not be considered a reliable criterion of performance. Rather than average temperatures, the maximum spot temperature attained on bimetal strip was found to be the major factor affecting performance characteristics.

The investigation likewise indicated that in actual practice extremely high bimetal temperatures can be reached with relative ease. Under the operating conditions employed, bimetal temperatures in excess of 800 F were obtained with ambient temperatures of 450 F or more, using a pilot flame of only 250 B.t.u. per hour, which is considered a very small pilot rate. Tests conducted on 24 water heaters of contemporary design gave ambient temperatures around the thermal sensitive elements of automatic safety controls ranging between 166 and 890 F. The median temperature was 490 F, with 13 heaters at this temperature or above, and 11 below. Thus 450 F is apparently less than the average ambient temperature encountered in water heater combustion chambers. From the data taken it becomes apparent that unless all factors of design and application are carefully considered for specific instances, it is quite possible that bimetals recommended for working temperatures of 800 F will be operating under conditions more severe than those for which they are recommended.

Another important design factor to be considered is that of maximum allowable stress. In a series of studies of bimetals having theoretical maximum working temperatures of 1200 F, the laboratory methods employed resulted in a permanent set of a few elements when they were subjected to stresses less than the maximum permissible as recommended by the manufacturer. Thus it is advisable to assume a sufficiently low maximum working stress when using the usual transverse bending formula since the actual stresses existing appear to be more complex than the simple stresses represented by the formula.

In addition to the spot temperature of the bimetal and the maximum allowable stress, other factors generally considered important when selecting a bimetal for application in an automatic safety control are the deflection characteristics of the bimetal and the force which it will exert for a given temperature change. These are readily determined mathematically according to the

COMPOSITION AND MAXIMUM RECOMMENDED WORKING TEMPERATURES OF BIMETAL SAMPLES*

		Constituents, Percent by Weight							*Working Temp., F*
Sample No.	*Thicknesses In.*	*High Expansion Side*			*Low Expansion Side*				
		Nickel	*Chromium*	*Iron*	*Nickel*	*Chromium*	*Iron*	*Cobalt*	
1	0.04	19	2	79	36	..	64	..	800
2	0.06	19	2	79	39	..	61	..	800
3	0.06	18	11	71	42	..	58	..	800
4	0.06	19	2	79	42	..	58	..	800
5	0.06	32	..	68	32	..	53	15	800
6	0.06	19	7	74	38	7	55	..	800
7	0.04, 0.06, 0.08	25	8	63	36	..	64	..	1200
8	0.04, 0.06, 0.08	25	8	63	42	..	58	..	1200
9	0.04, 0.06, 0.08	18	11	71	..	30	70	..	1200

* Obtained from Bimetallic Element Manufacturers.

desired application, allowing a suitable factor of safety. The range of maximum sensitivity and useful deflection for some of the bimetals in the investigation are shown in the following figure.

In selecting a bimetal it is recommended that the conditions under which the control is likely to be operated in field service be determined as accurately as possible. It is important that the ambient temperature to which the thermal element will be exposed and the maximum spot temperature which will be attained by the bimetal under this ambient temperature be determined in order to insure the selection of a bimetal having the desired characteristics within the range of temperature to be encountered.

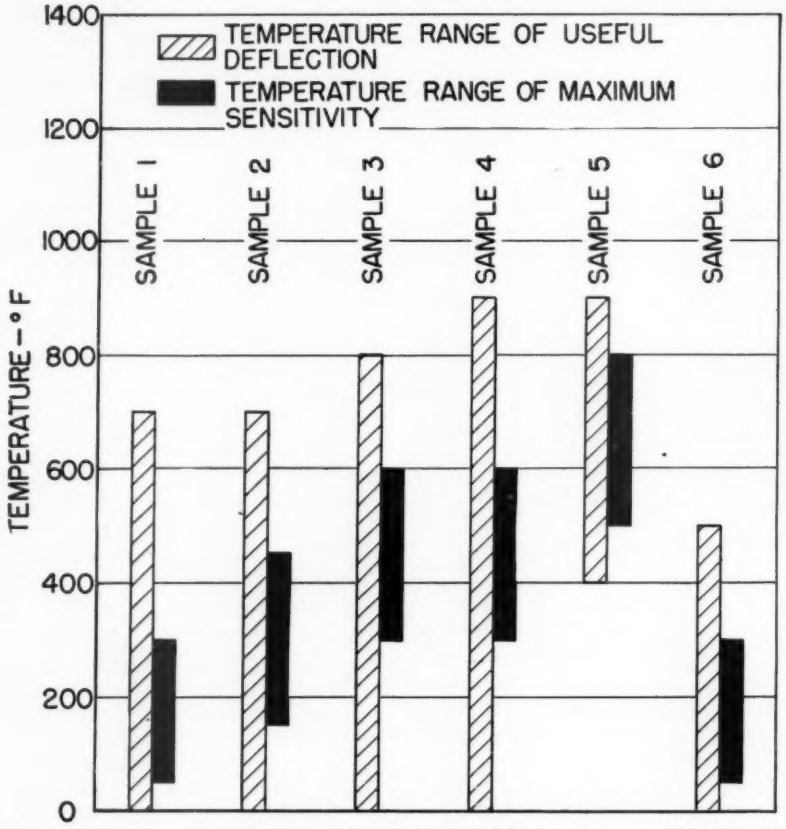


Chart showing ranges of maximum sensitivity and useful deflection for some of the bimetals which were tested in Laboratories' investigation

Knowledge of the load to which a bimetallic thermal element will be subjected is essential if permanent set resulting from overstress is to be avoided. Information on other factors such as atmospheres in combustion chambers or fuel gases which might cause excessive corrosion, or special sensitivity and deflection characteristics that may be desired, should also be considered in the selection of the bimetal.

Full information on all these points should be presented to the manufacturer of the bimetal for his consideration and recommendations. The major bimetal manufacturers interviewed have excellent laboratory facilities and specialized technical personnel for assisting control manufacturers in the selection of proper bimetals, and have expressed a desire to cooperate in this manner.

If a bimetal is to be ordered from the manufacturer in its final shape with all cold working operations completed, the bimetal manufacturer's heat treatment will probably be sufficient. On the other hand, if the bimetal is to be formed, drilled or otherwise cold worked, it must be subsequently heat treated in strict accordance with the instructions of the bimetal manufacturer. Failure to apply this final heat treatment correctly will unquestionably result in unsatisfactory performance in the field.

In order to further improve and insure satisfactory operation of controls using bimetals, it was felt that both the American Gas Association and bimetal manufacturers should devote considerable time and effort to bimetal research. The consensus of opinion was that this research should be conducted primarily on bimetallic thermal elements under conditions which are encountered in the field by gas pilot operated devices. Recognizing a need for bimetals which could be operated under load at higher temperatures than those currently available, it was suggested that research also be directed toward the development of products which would fulfill this need. Research project DGR-1-WH is being continued substantially along these lines.

Underground Gasification of Coal Surpasses Expectations

RESULTS of the joint experiment in underground gasification of coal conducted by the Alabama Power Co. and the U. S. Bureau of Mines at Gorgas, Ala., have surpassed expectations, outstanding scientists were told at a June 11 conference in the Bureau's Washington offices. Dr. A. C. Fieldner, chief of the Bureau's Fuels and Explosive Branch, acted as chairman of the meeting.

Engineers in charge of the Gorgas test where a block of coal was isolated and set afire with incendiary bombs under controlled conditions, stated that the coal was burned out clean without wastage. The shale roof, made plastic by intense heat exceeding 2,300 degrees Fahrenheit, expanded and folded down gradually to occupy the space left by the consumed coal. Air needed for combustion continued to flow, however, between the rock-coal interface. The roof-rock or shale was particularly favorable for underground gasification, swelling to two or three times its original volume and still maintaining sufficient strength to hold up the over-burden and prevent subsidence.

J. L. Elder, Bureau chemical engineer, stated that during the course of the 50-day project, 63 air-blast "runs" were made averaging 14 hours in length. To feed the flames at the base of a U-shaped tunnel, a blower pushed various concentrations of air and oxygen in at one portal while the gases were being trapped for careful analysis as they emerged at the other. Live steam blasts also

(Continued on page 366)

Indications of an Orifice Meter

Tests to determine effects of certain installation and construction conditions upon indications of orifice meters outlined, results summarized and conclusions drawn

BY HOWARD S. BEAN

Chief, Gas Measuring Instruments Section, National Bureau of Standards

● Abstract:—In 1929 four manufacturers of orifice meters made a series of tests to determine the effects of certain installation and construction conditions upon the indications of orifice meters. The conditions covered by these tests were: location and size of straightening vanes position and design of thermometer wells; roughness of pipe adjacent to an orifice; form of orifice holding flange; partial eccentricity of the orifice; thickness of orifice edge; and rounding of orifice inlet corner. The results of these tests have not been published heretofore, although they were utilized in reports of committees of the American Gas Association and the American Society of Mechanical Engineers. This paper outlines the tests, and summarizes the results, supplemented with conclusions thereon.

Introduction

BEGINNING in the summer of 1925 and continuing intermittently into 1930, the Gas Measurement Committee, Natural Gas Department of the American Gas Association, conducted and sponsored extensive tests on orifice meters. The object of many of these tests was to determine the effects upon the indications of an orifice meter of variations in the construction of the primary element of an orifice meter and the arrangement of its installation in a piping system. The results of all these tests were combined and the conclusions derived were the basis for the instructions and recommendations given in Report No. 2 of the Gas Measurement Committee and also in some of the reports of committees of the American Society of Mechanical Engineers.

Short accounts of one or two groups of the tests were printed soon after the tests were made.[1, 2] However, for much of the work, the only published account of it, outside of committee reports, is the summary of test data in the full report of the Joint A. G. A.–A. S. M. E. Orifice Coefficient Committee, of which there were only a very few copies printed.

During the past several years letters have been received by both A. G. A. and A. S. M. E. asking advice on some construction features of an orifice meter. In most cases the answers to these letters were based upon a series of tests made during the summer and fall of 1929 by manufacturers of orifice meter equipment. These tests were made upon the request of the Gas Measurement Committee in accordance with general instructions prepared by the writer, who was then acting as director of tests for the committee. Although these tests were made 17 years ago, the results derived are still valid and of considerable interest. Therefore it seems worth while to publish an account of them.

Lest it be inferred that these meter company tests were unique with respect to the objectives, it is appropriate to note that both before and since that time other researchers have made more or less similar studies. Accounts of some of these have been published. That this paper may be as informative as reasonable length will permit, the results from some of these other sources of data will be included.

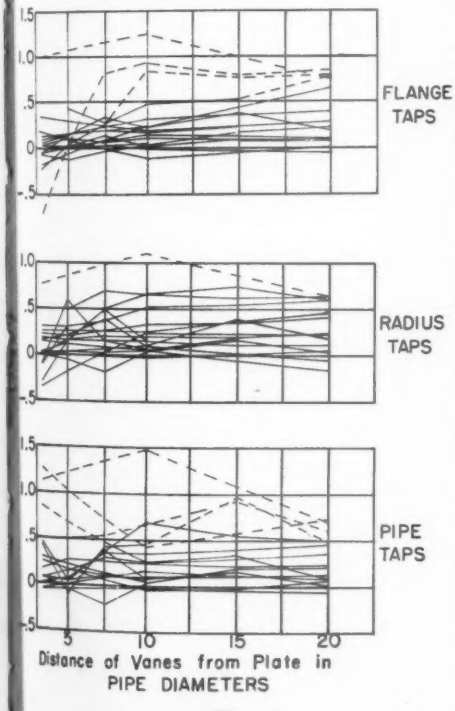


Figure 1

General Outline of Conditions Studied and Test Procedures

The particular conditions which were the subjects of investigation in these tests and the companies making the tests were:

1. Location and size of straightening vanes;
2. Position and design of thermometer wells, particularly when on the inlet side of the orifice plate;
3. Roughness of pipe adjacent to the orifice. The tests on these items were made by the American Meter Co., Metric Metal Works Branch;
4. Form of flange in which the orifice plate is held, was the subject of tests by the Foxboro Company;
5. Effects due to an orifice being slightly off-center with respect to the pipe, was the subject assigned to the Bailey Meter Company.
6. Width or thickness of the orifice (i.e. the cylindrical length of the orifice), and
7. Rounding of the inlet edge of the orifice, were the subjects handled by the Pittsburgh Equitable Meter Co. (now a Division of The Rockwell Manufacturing Company)

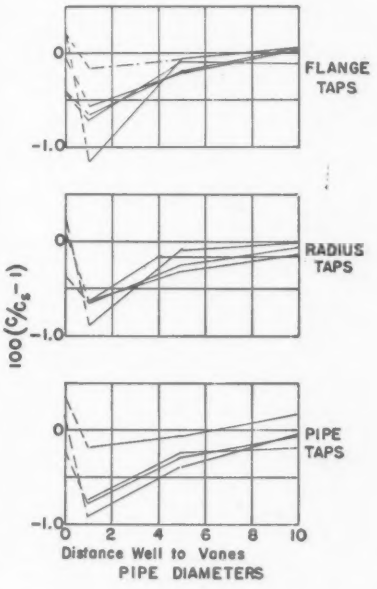


Figure 2

The test lines used by all four companies were standard weight four-inch pipe. In all cases the pipe was carefully selected for smoothness and thoroughly cleaned. In at least one case brass pipe was used for the test lines. The test stations were provided with three pairs of pressure taps, namely: flange, radius and pipe. The flange taps were centered one inch (less thickness of gasket) from the bearing face of each flange. Radius taps were placed one pipe diameter on the inlet side and ½ pipe diameter on the outlet side, both being measured from the inlet face of the orifice plate. Pipe taps were lo-

cated at 2.5 pipe diameters on the inlet side and eight pipe diameters on the outlet side, both measured from the inlet face of the orifice plate.

Three orifice diameters were used, 1.25 inch, 2.00 inch, and 2.75 inch, the corresponding values of β, the diameter ratio, being 0.31 inch, 0.50 inch, and 0.69 inch.

In all but item 5, air was used as the test media. The Bailey Meter Co. found it more convenient to use water.

In most cases another orifice meter was used as a reference. Since for the object of these tests changes in relative values would show the effects of the conditions under investigation, it was not necessary to obtain absolute values of the discharge coefficient.

It has been found convenient to report the results of these tests by showing the percent of change produced in the discharge coefficient of the orifice. This may be expressed mathematically as

$$\left(\frac{C}{C_s} - 1\right) \times 100$$

C = the discharge coefficient of the orifice under test conditions

C_s = the discharge coefficient of the same orifice under the reference conditions, or the discharge coefficient of the reference orifice.

It should be observed that this change in the discharge coefficient is in the opposite direction to the error which might be introduced into an orifice meter measurement if a condition existed similar to that being studied. To illustrate, assume that at some meter station the orifice plate had a dull inlet edge and that this dullness was comparable to an edge rounding ratio of 0.02 or two percent. Then according to Figure 7 the *computed* quantity flowing through the orifice will be four percent less than would be obtained if the orifice had a square inlet edge, because the observed differential pressure will be lower than it would be with a square-edged orifice.

Description of Tests and Results

1. a. Location of straightening vanes—The object of these tests was to see if there is a minimum distance to be maintained between straightening vanes and the inlet face of an orifice plate in order that the effects of the vanes will not be appreciable ($\pm$ 0.1 percent) or objectionable for commercial measurements ($\pm$ 0.5 percent). The procedure was to set up the test line with as long a straight run of pipe as possible on the inlet side of the test meter, 60 or more pipe diameters. Then with no vanes (or vanes at the very inlet end of the run) tests were made on three sizes of orifices and at several rates of flow. These tests established the values of C_s (for this set of tests). Straightening vanes were then placed successively at 20, 15, 10, 7.5, 5 and 3.5 pipe diameters from the orifice plate, and tests were made with the same plates and rates of flow as before.

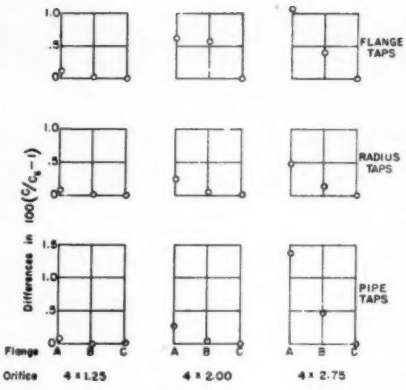


Figure 4

Since there appeared to be no definite difference in the results from the different orifice sizes and rates of flow, all of the results for each pair of taps have been plotted together and are shown in Figure 1. If there were a definite effect due to the position of the vanes we would expect a variation in the spread of the results for the various positions, or their general departure from the 0.0 percent line would be greater. Omitting the few results which appear far out of line from the rest, which are indicated by dotted lines in Figure 1, we find no indication that the position of the vanes had any certain influence on the results. To be sure, the variation found between the different tests is appreciable, but the width of the bands of lines for all three pressure tap locations is about 0.5 percent. The average displacement of the band center is about + 0.2 percent.

b. Size of straightening vanes—For these tests two sets of vanes were used. One was composed of 7/8 inch O.D. tubes 5.5 inch long; the other was composed of 9/16 inch O.D. tubes 5.5 inch long. For the larger tube vanes the ratio of the tube diameter to the pipe diameter is 0.22 For the smaller tube vanes this ratio is 0.14.

There were nine pairs of tests for the two sizes of vanes used. In five of these sets the effects were distinctly less with the 7/8 inch x 5.5 inch tube vanes than with the vanes with smaller tubes. Two sets gave lower values when the vanes with smaller tubes 9/16 inch x 5.5 inch were used. The two remaining pairs gave no definite preference to either size of vane.

2. Thermometer wells—First a bare mercury-in-glass thermometer was used, placed one pipe diameter from the outlet end of the straightening vanes (i.e. towards the orifice plate). Tests were made with the vanes 3.5 and 20 pipe diameters from a four inch x 1¼ inch orifice plate. With but one exception the apparent effect of the presence of the thermometer on C was less than 0.2 percent.

Next with straightening vanes placed 5 pipe diameters from the orifice plate, tests were made with a plain 0.5 inch thermometer well and a finned thermometer well (about 13/16 inch over the fins) placed at several distances upstream from the inlet end of the vanes. The results of these tests with two orifice sizes and two rates of flow are shown in Figure 2.

3. Rough pipe adjacent to an orifice—To determine the effects of rough pipe adjacent to an orifice as compared to smooth pipe, fine sand was stuck with shellac onto the inner surface of the brass pipe over a distance of 40 inches, (ten inches P.D.) from the orifice plate. The results of the few tests run with this condition are given below in Table I.

Apparently there is a very appreciable difference between the indications of an orifice meter with smooth pipe or roughened pipe adjacent to the orifice plate. This fact is also indicated by the coefficients given in the Report of the Joint A. G. A.–A.S.M.E. Orifice Coefficient Committee,[5, 6] where the coefficients increase as the pipe size is decreased.

4. Flange form—The three forms of flanges used in these tests are illustrated in Figure 3. These flanges with their respective sections of pipe were successively used in series with a reference orifice meter. The results from these tests are shown graphically in Figure 4. In this plot the abscissa scale is used to represent the type of flange and is non-dimensional.

It is of interest that in some tests made by the Gas Measurement Committee at Buffalo, N. Y., in 1928 flanges similar to "A"

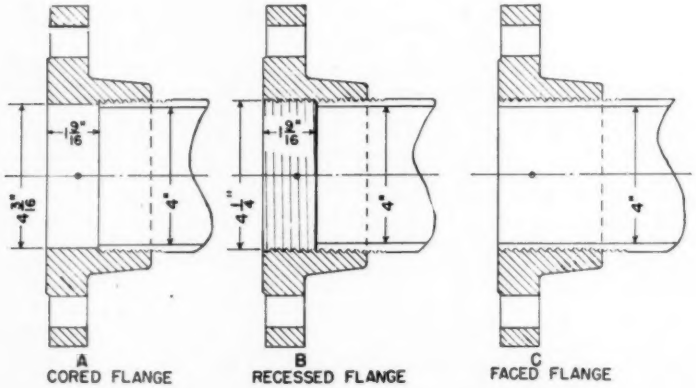


Figure 3

and "C" of Figure 3 were used. In those tests the discharge coefficients obtained with the A form of flange were consistently higher than those obtained with the C flange.

Since then some more extensive tests on the effects of flange form were made at Columbus, Ohio, by Prof. S. R. Beitler and J. E. Overbeck.[7] They concluded that if the length of the recess or coring (see A and B, Figure 3), as measured parallel to the axis of the pipe, does not extend more than ¼ inch in from the bearing face of the flange, the effect on the orifice coefficient will not exceed 0.25 percent.

5. Effects of an orifice being off-center—These tests were made in a four inch line with the three sizes of orifices previously mentioned. With each size, three different degrees or amounts of off-centering were used ranging from about five percent to 25 percent of the maximum possible eccentricity. At each pressure tap location there were four taps located 90° apart about the circumference. The displacement of the orifices was along a pipe diameter determined by two opposite taps as illustrated in the lower part of Figure 5. A concentric orifice placed on the inlet side of the test orifice and fitted with three pairs of pressure taps in a single row was used as a reference meter.

All of the tests were made with water.

The results from these tests are summarized in Table II. As shown by the differences in column 8, the predominant effect is to cause the discharge coefficient for the tap *towards* which the orifice is displaced, to increase. In other words, the differential pressure between the taps *towards* which the orifice is displaced decreases while that between the taps *away* from the displacement increases.

From column 11 it is seen that there is fully as much difference between the pressure taps at right angles to the direction of the orifice displacement. In this case the discharge coefficient for the right hand taps (facing the inlet side of the orifice plate) increased. There is nothing in the data or accounts of the tests to explain this.

The maximum difference between any pair of pressure taps, and irrespective of sign, is shown in column 12.

The curves in Figure 5 show these differences graphically, without regard to sign. The abscissa for the curves are the values of the product of the eccentricity ratio, "M," and the diameter ratio, β, because it is evident from Table II that the effect of dis-

TABLE I

EFFECT OF ROUGH PIPE ADJACENT TO AN ORIFICE

Orifice Diameter, Inches	*Approximate Differential in* H_2O	*Values of* 100 $(C/C_s - 1)$ *Flange Taps*	*Radius Taps*	*Pipe Taps*
		With Roughened Pipe on Inlet Side of Orifice		
1	5	—0.2	—0.19	—0.26
1	20	— .07	— .06	— .13
2	5	+ .46	+ .65	+ .36
2	20	+ .95	+ .87	+ .34
		With Roughened Pipe on Both Sides of Orifice		
1	5	—0.13	—0.16	—0.06
1	20	— .09	— .13	+ .09
2	5	+ .57	+ .52	+ .65
2	20	+1.07	+ .99	+ .87

TABLE II

SUMMARY OF RESULTS FROM OFF-CENTER TESTS

Test Group	*Orifice Diam. d in.*	*Diam. Ratio β*	*Eccentricity Ratio M*	*M. β*	*Values of* 100 $(C/C_s - 1)$ *Top Tap*	*Bottom Tap*	*Difference (7)-(6)*	*Left Tap*	*Right Tap*	*Difference (10)-(9)*	*Max. Min.*
1	2	3	4	5	6	7	8	9	10	11	12
					Flange Taps						
I	2.751	.682	.244	.166	—0.45	+1.0	+1.45	—1.3	0.0	+1.3	2.3
II	2.750		.146	.100	— .9	— .5	+ .4	—1.45	— .8	+ .65	.95
III	2.7505		.049	.033	— .55	— .5	+ .05	— .5	— .35	+ .15	.2
IV	2.000	.496	.246	.122	+ .8	+ .7	— .1	+ .75	+ .9	— .15	.2
V	2.000		.154	.076	— .45	— .15	+ .3	— .4	— .4	.0	.3
VI	2.000		.061	.030	— .35	— .35	.0	— .35	— .35	.0	.0
VII	1.250	.310	.224	.070	+1.1	+ .7	— .4	+1.05	+ .11	+ .05	.4
VIII	1.250		.135	.042	.0	.0	.0	.0	— .10	+ .1	.1
IX	1.250		.045	.014	.0	.0	.0	.0	.0	.0	.0
					Radius Taps						
I	2.751	.682	.244	.166	—0.8	+0.5	+1.3	—1.0	+0.2	+1.2	1.5
II	2.750		.146	.100	—1.1	— .5	+ .6	—1.3	— .8	+ .5	.8
III	2.7505		.049	.033	— .8	— .7	+ .1	— .8	— .6	+ .2	.2
IV	2.000	.492	.246	.122	+ .75	+ .6	— .15	+ .6	+ .8	+ .2	.2
V	2.000		.154	.076	— .6	— .3	+ .3	— .7	— .55	+ .15	.4
VI	2.000		.061	.030	— .6	— .6	.0	— .6	— .6	.0	.0
VII	1.250	.310	.224	.070	+1.0	+ .75	— .25	+1.25	+1.1	— .15	.5
VIII	1.250		.135	.042	— .05	.0	+ .05	— .1	— .05	+ .05	.1
IX	1.250		.045	.014	.0	.0	.0	.0	.0	.0	.0
					Pipe Taps						
I	2.751	.682	.244	.166	+0.2	+0.2		+0.2	+0.2		
II	2.750		.146	.100	— .6	— .6		— .6	— .6		
III	2.7505		.049	.030	— .4	— .4		— .4	— .4		
IV	2.000	.496	.246	.122	+ .1	+ .1		+ .1	+ .1		
V	2.000		.154	.076	— .25	— .25		— .25	— .25		
VI	2.000		.061	.030	— .5	— .5		— .5	— .5		
VII	1.250	.310	.224	.070	+ .2	+ .2		+ .2	+ .2		
VIII	1.250		.135	.042	— .4	— .4		— .4	— .4		
IX	1.250		.045	.014	— .2	— .2		— .2	— .2		

TABLE III

SUMMARY OF RESULTS OF TESTS ON EFFECTS OF ORIFICE-EDGE THICKNESS

Plate Size & Diameter Ratio	*Orifice Edge Thickness t inches*	*Thickness Ratio t/D_2*	*Effective Thickness Ratio $\beta \frac{t}{D_2}$*	*Average Values of 100 $(C/C_a - 1)$*		
				Flange Taps	*Radius Taps*	*Pipe Taps*
1	2	3	4	5	6	7
4 × 1.25	0.1265	0.101	0.0316	+ 0.7	+ 0.8	+ 0.7
				.1	.1	.2
$\beta =$ .313	.2515	.201	.0629	1.1	1.2	1.2
				.4	.4	.4
	.3765	.301	.0942	7.4	7.4	7.4
				7.3	7.3	7.3
	.5015	.401	.1255	7.8	7.8	7.8
				6.7	5.9	6.2
4 × 2.00	.2012	.101	.0506	.5	.6	.5
				.5	.3	.5
$\beta =$ .005	.4015	.201	.1006	1.3	1.2	1.6
				2.2	1.8	2.3
	.6015	.301	.1508	2.7	2.7	2.6
				2.4	2.1	2.5
	.8015	.400	.2005	6.7	6.8	7.1
				6.9	6.6	7.0
4 × 2.75	.2743	.100	.0688	— 1.1	— 0.2	.1
				+ 1.5	+ .7	1.0
$\beta =$ .688	.5507	.200	.1376	1.0	2.1	1.8
				2.9	2.4	3.0
	.8258	.300	.2063	8.1	10.1	8.0
				10.0	10.3	9.5
	1.101	.400	.2752	14.3	18.2	19.0
				17.0	19.8	16.9
4 × 1.00	.036	.036	.0096	0.0	0.0	0.0
$\beta =$ .2656	.067	.067	.0178	.5	.4	.6
N.B.S.	.124	.124	.0329	.0	.1	.4
Tests	.243	.243	.0646	1.8	1.6	1.6
	.370	.370	.0982	1.5	1.5	1.8
	.488	.488	.1296	6.5	7.2	7.9
	.747	.747	.1984	18.0	18.0	17.8
	.996	.996	.2645	21.7	21.0	21.9

placement depends upon both the relative amount of displacement and the diameter ratio. The eccentricity ratio, as used here, is defined by

$$M = \frac{2m}{D_1 - D_2}$$

m = linear displacement of the orifice center from the axis of the pipe.

As customary, D_1 and D_2 are respectively the pipe and orifice diameters.

From the results of these tests it appears that with either flange or radius taps, and up to a diameter ratio of almost 0.7 an orifice may be improperly centered by as much as five percent of the maximum possible eccentricity, i.e. M = .05, without affecting the value of the discharge coefficient by more than 0.1 percent to 0.2 percent, an amount ordinarily below the limit of uncertainty in orifice meter measurements. With pipe taps which measure only the overall pressure loss through an orifice, there is no effect even with 25 percent of the maximum possible eccentricity.

6. Effects of orifice-edge thickness. In these tests three sets of orifice plates were used, one set for each orifice diameter. In each set there were four orifice plates of different thickness. These thicknesses were so selected that the ratios of thickness to orifice diameter, t/D_2, were about the same for all three sets.

The tests were made with air discharged through two orifice stations in series. In part of the tests the reference plates were used in the first or upstream station. In the remaining tests they were used in the second or downstream station. By using the mean of the results thus obtained it was hoped the effects of installation would be eliminated.

The results of the tests are summarized in Table III. The upper line of values in columns 5, 6 and 7 for each plate are the results with the test plates in the second or downstream station, and the lower line is the results with the locations of the test and reference plates interchanged.

It will be noticed that, except for minor variations, the results for the three pairs of pressure taps are nearly the same. Hence, the average of the six values of 100 $(C/C_a - 1)$ for each plate has been used in plotting the points shown in Figure 6.

In addition to the tests by the Pittsburgh Equitable Meter Co., a similar series of tests were made by the National Bureau of Standards in the course of the Edgewood Tests[8] The results of these tests are included in Table 3 and Figure 6.

By inspection of the values in columns 5, 6 and 7 of Table III, with those of the thickness ratio in column 3, it appears that the effect of orifice-edge thickness is dependent upon a size element of the orifice as well as the thickness ratio. Such a size element is the diameter ratio β. Hence, the "effective thickness ratio," $\beta \frac{t}{D_2}$, is used for the abscissa scale in Figure 6.

7. Effects of rounding the inlet corner or edge of an orifice—As in the tests described under 6 there were three sets of orifice plates. Each set had five plates, the inlet corners of which were rounded by different amounts ranging from zero radius of curvature, i.e. a square corner, to 1/32 inch. The values of these radii are given as R′ in column 2 of Table IV. All of the plates were about 1/8 inch thick. The same reference plates and orifice stations were used in these tests as in the tests of group 6. Also, as described under 6, the stations of the test orifice and reference orifice were interchanged for a part of the tests.

A summary of the results of the tests is given in Table IV. As before, the upper values in columns 4, 5 and 6 were obtained with the test orifice plate in the second or downstream station, the lower values with the test and reference plates interchanged. Since there appears to be very little difference in the effects of edge rounding for the three pairs of pressure taps, the average of all values for each plate has been used in plotting the results as shown in Figure 7. Also, the results appear to vary with the curvature ratio only and to be independent of any other size element. Hence, in preparing Figure 7 the "curvature ratio," R'/R_2, was used for the abscissa scale.

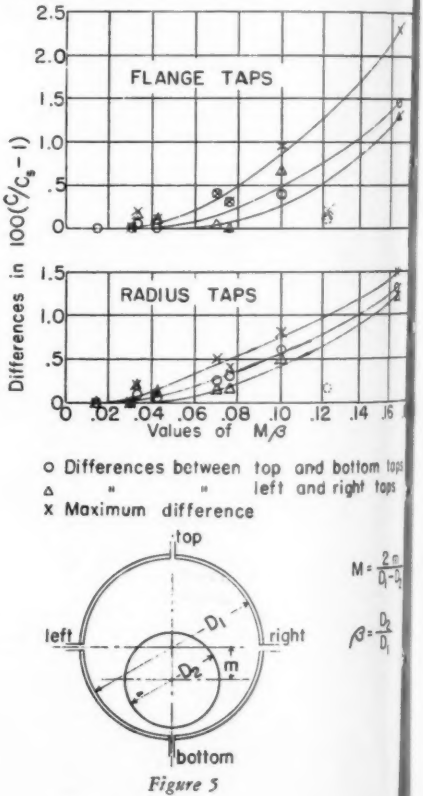


Figure 5

As noted in the introduction, the results from these tests together with other data were used as a basis for some of the recommendations on orifice meter use, as given in such reports as the Gas Measurement Committee Report No. 2.[5-7] Hence, in these comments frequent reference will be made to such recommendations.

1. a. If we omit consideration of the broken lines in Figure 1 the spread of the remaining lines does not indicate with certainty any preferable location for straightening vanes. Possibly the region between five and ten pipe diameters has a slight advantage. In Report No. 2[6] a minimum distance of five to eight pipe diameters is recommended, while Flow Measurement[7] gives a single value of eight pipe diameters. Neither report sets a maximum beyond which vanes should not be located. Based on the results shown by Figure 1, the recommendations of both reports seem reasonable.

b. The few tests on variations in the proportions of straightening vanes, made in connection with this group of tests, did not cover a sufficient range to serve as a basis for any conclusions.

2. If a thermometer well is to be located on the inlet side of an orifice, then according to Figure 2, it should precede (i.e. be on the inlet side of) the inlet end of the straightening vanes by at least ten pipe diameters. (It is noted that Report No. 2 specified one pipe diameter or more. According to Figure 2, the emphasis should be on "more.") Both Report No. 2 and Flow Measurement recommend placing thermometer wells on the outlet side of an orifice plate wherever possible.

3. On the basis of the few results reported in Table I, the sections of pipe immediately adjacent to an orifice plate, i.e., the meter runs, should be as smooth as is commercially practicable. This becomes more important as the diameter of the orifice is increased.

4. From the results of the tests on the form of flanges for orifice meters, as shown by Figure 4, as well as those reported by Beitler and Overbeck,[8] it appears that the type represented by "C" of Figure 3, is to be preferred. Where welded construction is used this result may be achieved by using a welding neck flange, provided any bead on the inside of the pipe is smoothed down. Instances have been reported in which a Vanstone-like flange was used with welding replacing the upsetting of the pipe end at the flange face.

5. On the results shown by Table II and Figure 5 it appears that the necessity of carefully centering an orifice with the axis of the pipe may have been over-emphasized. In order that the uncertainty from this source shall not exceed 0.1 percent or 0.2 percent it will be sufficient to keep the product of the eccentricity ratio and diameter ratio, $M\beta$, below 0.04. With an eight inch x six inch orifice this would amount to keeping the displacement within about 0.05 inch (3/64 inch), and with an eight inch x four inch orifice within about 5/32 inch.

6. From the curve shown in Figure 6 it appears that the "effective thickness ratio," $\beta \frac{t}{D_2}$, should not exceed about 0.04 if the effects of orifice edge thickness are not to exceed about 0.2 percent or 0.3 percent. Report No. 2 gives three specifications for the orifice edge thickness, the one giving the smallest value governing. Flow Measurement specifies that the orifice edge thickness shall not exceed two percent of the pipe diameter. As a comparative example, consider an eight inch x six inch orifice. Using $\beta \frac{t}{D_2} = 0.04$, gives $t = 0.32$ inch. The minimum requirement for this case by Report No. 2 would be 0.25 inch, and that by Flow Measurement, 0.16 inch.

7. From Figure 7 it is seen that only a slight rounding or "dulling" of the inlet corner of an orifice will have a rather large effect upon the coefficient. Using the limit as 0.2 percent to 0.3 percent as before means that the "curvature ratio" R'/R_2 should not exceed about 0.001. For a four inch x two inch orifice this means that the radius of

(Continued on page 349)

TABLE IV

SUMMARY OF RESULTS OF TESTS ON EFFECTS OF ROUNDING INLET CORNER OF AN ORIFICE

Plate Size and Diameter Ratio	*Inlet Corner Radius R' inches*	*Curvature Ratio R'/R₂*	*Average Values of 100 (C/Cₛ — 1)*		
			Flange Taps	*Radius Taps*	*Pipe Taps*
1	2	3	4	5	6
4 × 1.25	0.0000	0.0000	—0.3	—0.3	—0.4
			+ .5	+ .5	+ .5
β = .313	.003	.0048	1.2	1.3	1.2
	.006	.0096	2.0	2.0	2.0
	.0125	.0200	3.9	3.9	4.1
			3.8	3.7	4.0
	.0312	.0500	9.0	9.0	9.6
			8.8	8.7	9.3
4 × 2.00	0.0000	.0000	.1	.2	.1
β = .5005	.003	.0030	.9	1.1	1.1
	.006	.0060	1.7	1.8	2.3
			1.4	1.3	1.6
	.0125	.0125	2.5	2.5	2.9
			4.4	4.4	5.2
	.0312	.0312	5.9	6.0	7.1
4 × 2.75	.0000	.0000	.5	.3	.2
β = .688	.003	.0022	.6	.5	.6
			2.2	1.2	2.0
	.006	.0044	.6	1.2	1.1
			1.8	1.5	2.4
	.0125	.0091	1.6	1.8	2.9
			3.5	2.6	3.9
	.0312	.0227	4.5	4.6	6.0
			5.7	4.9	6.4

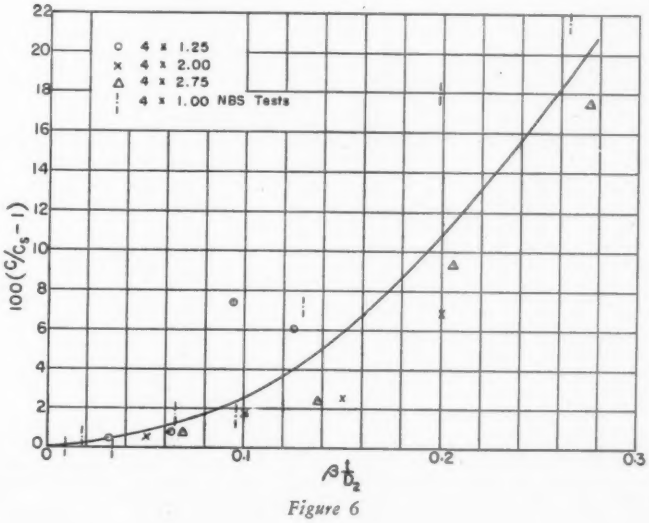


Figure 6

Propane Equipment Pinch Hits for Water Gas Plant Disabled in Vermont Flood

A SUDDEN dam-break and flood on June 3 entirely swept away buildings of the Central Vermont Public Service Co., including the meter house, compressor house, purifiers, etc., and caused heavy damage to other company property. Debris in many parts of the plant was 10 feet deep.

As it was evident that the water gas plant would be out of operation for considerable time, George W. Peck III and A. E. Shippe, in charge of the gas operations, contacted H. Emerson Thomas and Associates, Westfield, N. J., on June 4 and ordered a propane-air plant to help restore service to the 3,500 customers in Rutland. Subsequently a 60,000 cubic foot per hour gas-air mixing machine was trucked into the city over a distance of 600 miles in about 24 hours. A steam-fired propane vaporizer was borrowed from Portland Gas Light Co. and Utilities Distributors, Inc., of Portland, Maine. Smaller accessory equipment was shipped in by truck or air express.

Propane was brought in by tank car for temporary use until the storage tank could be shipped and installed. Approximately 300 feet of two inch welded line had to be laid from this tank car to the vaporizer. All of this line was run from 20 to 30 feet overhead across building roofs out of the way of bulldozers, steam shovel and cranes cleaning up the debris. The vaporizer outlet was connected to the stub end of the broken 12-inch hot make line with a return line from the relief holder to the inlet of the gas-air machine. The outlet of this machine was connected to the storage holder.

Liquid was taken from the storage tank through the two-inch line into the vaporizer where it was converted to vapor by steam heat. The relief holder was then filled with undiluted propane vapor of approximately 2,500 to 3,700 B.t.u.'s per cubic foot. This holder throws approximately four inches of water column and thus furnishes the gas supply for the inlet to the mixing unit. Six days after the work began the propane-air mix was then made into the storage holder for distribution to customers.

At this time the utility service department began turning on customer services which had been shut off immediately after the flood, giving first attention to top burner use and tagging all automatic appliances to be left turned off until proper adjustments could be made. At two points where bridges had been washed out the mains had to be repaired and cleaned out before gas could be distributed. This work was completed on the same day that the plant started making gas.

By installing adjacent to the new plant a range taken directly from the mains, then making the proper B.t.u. gas without adjustment of the burners a propane-air gas was obtained which contained approximately 650 B.t.u.'s in comparison with the previously used 540 B.t.u. water gas. This meant that range top burners did not have to be adjusted at that time and servicemen could turn on the maximum number of ranges a day. A Junkers calorimeter was also trucked in by American Meter Co., following the loss of the plant calorimeter in the flood, and installed in a temporary building adjacent to the propane-air gas plant.

Many other gas companies assisted in the turn-ons. Service men came from Montpelier, Brattleboro, Barre, Bennington, Burlington and Springfield, Vermont; Claremont and Manchester, N. H., and Albany, N. Y.

Supplers Mark Tenth Anniversary

Supplers at anniversary celebration: Carl A. Schlegel, William H. Parish, Alexander Forward, former managing director, American Gas Association, and John B. Klumpp

CELEBRATING the tenth anniversary of the founding of the Gild of Ancient Supplers, two score members gathered for a birthday dinner at the Meridian Club in Philadelphia, May 9. Membership now numbers 210 and includes only men who for ten years or more have been furnishing equipment, materials, supplies, appliances, and professional skills to the gas utility companies of the country.

Presiding officer at the birthday dinner was the regional Warden, W. Roberts Cameron of Philadelphia. Brief speeches on Gild history and ideals were made by: Mayor Joe A. Mulcare, New York; Keeper of the Treasure Glenn H. Niles, Ridgewood, N. J.; Alderman E. Carl Sorby, Rockford, Ill.; First Past Mayor William S. Guitteau, Fort Lauderdale, Fla., and Second Past Mayor C. Edwin Bartlett, Philadelphia.

Guest of honor was Jacob B. Jones, superintendent of the Bridgeton (N. J.) Gas Light Co., who represented the "Gas House Terriers." Mr. Jones will celebrate next April 1 his fiftieth year as an operating gas man.

The dinner was arranged by Master of Revels Joseph A. Messenger, New York. Others present were: Regional Wardens George P. Velte, Boston; J. Albin Johnson, Long Island City, and David S. Sharpe, Atlanta; Honorary Member Alexander Forward, former managing director of the American Gas Association, and the following Supplers:

John F. Mooney, Orlando, Fla.; Homer Dufault, Springfield, Mass.; Benjamin L. Landis, Chambersburg, Pa.; and Herbert C. Erhard, Baltimore.

From New York—James I. Gorton, Wilson J. Kite, Jr., Stanton G. Krake, William H. Parish, George H. Smith, A. G. A. assistant managing director and director, Natural Gas Department; Harold W. Springborn and H. Leigh Whitelaw.

From Philadelphia—Thomas H. Clark, John L. Eigenbrot, William J. Foster, Carl A. Goodwin, William G. Hamilton, Jr., L. Minford Humrichouse, John B. Klumpp, R. W. McClenahan, E. W. Mears, Leslie E. Moxon, Carl A. Schlegel, J. Mortimer Traugott, Sol W. Weill, Edward B. Wilson, Duncan A. Worrell, and John B. Wynne.

Gas Utilities Win Awards in P. U. A. A. Better Copy Contest

MORE than 130 admen and adgirls registered at the twenty-sixth annual convention of the Public Utilities Advertising Association June 18-19 at the Book-Cadillac Hotel, Detroit. Morning and afternoon programs featured interesting presentations and discussions with outstanding speakers listed for each of the luncheon meetings. The Michigan Consolidated Gas Co. and the Detroit Edison Co. were hosts at the luncheons.

Forty-five national awards and 90 honorable mentions were presented to winners in the Better Copy Contest. Among the gas company winners were Indiana Gas & Water Co., Minneapolis Gas Light Co., Southern California Gas Co., Houston Natural Gas Corp., Atlanta Gas Light Co., Natural Gas Companies, Pittsburgh, The Brooklyn Union Gas Co., The Philadelphia Gas Works Co., Michigan Consolidated Gas Co. and The Hartford Gas Company. Many of the combination company members of the American Gas Association were listed as winners of awards and honorable mention.

Subjects considered at the daily sessions included advertising effectiveness, merchandise advertising, publicity, public and employee relations and community development. James E. Humphreys, The Ohio Fuel Gas Co. and William B. Hewson, The Brooklyn Union Gas Company, presented the industry's views on gas appliance advertising. Henry Obermeyer, Consolidated Electric Co. presented the report of the survey of comparative utility advertising costs made by the committee headed by Clarence L. Law. Robert R. Gros, Pacific Gas and Electric Co., told the convention of his company's work in attracting new industries to the San Francisco area. Charles J. Allen, The Connecticut Light & Power Co., president of P. U. A. A., presided at the general sessions.

F. W. Dopke and L. B. Schiesz, Indiana Gas & Water Co., Inc., officials, reviewing with G. S. Diener, advertising agency head, utility's two national first-place awards in P.U.A.A. contest for ads promoting use of gas service

Officers elected for the coming year in-

(Continued on page 373)

Southern Counties Aids Girls' Organizations

Colorful folder with inside pockets for leaflets and publications prepared by Katherine Rathbone, home service director, Southern Counties Gas Co., Los Angeles, to help members of girls' organizations enrolling in food and nutrition classes

Russia Orders Latest U. S. Oil, Gas Equipment for Five Year Program

THE Russian Government has ordered eight deep-drilling rigs, 26 portable drilling rigs, ten portable clean-out rigs, over 100 pumping units, a liquid methane plant, and various other miscellaneous equipment, from Dresser Industries, Inc., Cleveland, Ohio. J. B. O'Connor, executive vice-president, has returned to this country after eight weeks spent in Moscow negotiating the sale.

The deep-drilling rigs are the latest type capable of drilling to 15,000 feet and will be used in the fields between the Volga and the Urals in the District of Kuibysheve.

The rambler rigs with portable equipment capable of drilling to 6,000 feet, the clean-out rigs capable of operating to 9,000 feet, and the pumping units will be put to work for rehabilitation purposes in the Maikop Field that was almost destroyed during the war.

"The Russian program of petroleum and gas rehabilitation and development, which is part of the current five-year plan, is a really stupendous undertaking," Mr. O'Connor reported. "To understand it, one must bear in mind that the Russian program embraces plans for the entire nation; that it is much larger in its potentialities than would be a similar program conducted by any one company in the United States and that eventual possibilities are unlimited because of the vast reserves of crude which as yet have hardly been tapped.

"In carrying out this program the Russians are using the finest and most modern type of equipment. I talked with top technicians in the production, refining, natural gas and other divisions of the program who are truly experts in their fields and who uniformly possess an almost unbelievable capacity for a hard day's work. It was interesting that many of them had in past years spent some time in the United States and in fact I had first become acquainted with many of them upon their visits to the States in prewar years.

"As an example of modernization, in their cracking units they are now replacing pumps of the horizontal reciprocating type by those of the centrifugal hot oil type."

Mr. O'Connor declared that the Russians are determined to rehabilitate the fields destroyed during the war by clean-out, repair and new drilling. In addition, he said, they intend to develop new fields by deep-drilling methods just as modern as those employed in our own country.

"Of particular interest is the natural gas pipeline running between Saratov and Moscow. It is expected that the increased supply of natural gas to Moscow will relieve pressure on the railroads that are now overtaxed by carrying peat, lignite, and fuel oil.

"I inspected this pipeline. It is a good job. A compressor station on this line which I visited is not only up to the latest American technical standards but is designed furthermore to operate in temperatures as low as 40° below zero.

"This line will be served by the liquid methane plant which will handle storage of liquefied natural gas for standby and peak load purposes."

BOOK REVIEWS

HOW TO BECOME WELL KNOWN, by Henry F. Woods, Jr. (Price—$2.50.) Duell, Sloan and Pearce, Inc., 270 Madison Ave., N. Y.

HENRY F. WOODS, JR., prominent New York publicity and public relations counsel, is widely known in the gas industry for the highly effective publicity campaign which he conducted during the first five years of the American Gas Association's national advertising program.

Mr. Woods has devoted 20 successful years to the job of making persons, firms, organizations and causes well known. In "How To Become Well Known," he has incorporated for the first time the many techniques used to give persons public recognition and standing. The book is helpful and inspiring and contains the result of years of study, observation and practical work.

Written in serious vein for those who are ambitious to succeed, the book contains case histories of success which explain how the many goals of man's activities can be reached through achievements, speeches, publicity, determined campaigning, and careful work.

"How To Become Well Known" is Mr. Woods' second book. His first venture as an author resulted in the production of "Profitable Publicity—How To Do It—How To Get It," and established him as an authority in the specialized field of publicity and public relations.

ANATOMY OF DEPRECIATION, by Luther R. Nash. 225 pages. (Price—$5.00.) Public Utilities Reports, Inc., Munsey Building, Washington 4, D. C.

THE purpose, scope and origin of this book are clearly expressed in the Foreword:

"For more than forty years, during which depreciation problems have largely developed and which include the useful life of the major part of utility depreciable property, the author has been occupied with utility matters as engineer, manager, supervisor and consultant. Within this period he has been a member of depreciation committees of three of the national utility associations, electric power, traction and gas, has cooperated in the design of accounting systems and presented rate matters, including their depreciation phases, before many regulatory and investigating agencies and courts.

"During such a long period of diversified experience, it might be expected that opinions and practices would become stabilized, but growth and radical changes have operated against any static viewpoint. Nor have we yet reached such technological or economic stability as to justify rigid standardization relating to an uncertain future. The author has, therefore, attempted to present a history of the development of depreciation accounting and the adequacy or lack of it in the provisions reflected therein, then to summarize the present conflicting views relating to future procedure, all supplemented by such available facts and forecasts as may be helpful in pointing the way to a reasonable solution."

The author has made his presentation in a simple and lucid manner which will be considered an accomplishment by anyone who has given serious thought to the complexities of the depreciation problem. In this connection, the first three chapters of the book deserve particular commendation for the down-to-earth analysis of the early history of accounting practices affecting the utility industry, including "Retirement Accounting" and the "Straight-Line Method."

In Chapter IV entitled, "Service Lives," to which more than a quarter of the book is devoted, the author has given a bird's-eye view of the various factors affecting service life estimates, together with an intentionally brief description of the better-known techniques. Because of this brevity, the book can lay no claim to being a hand-book on depreciation methodology but should be considered as a valuable adjunct for students of the subject whose technical knowledge should be supplemented by an appraisal of methods in light of their applicability in actual practice.

The main theme of the book is to divide the "anatomy" of depreciation into two fields: one including the field of depreciation technique in which the annual depreciation charge is the determining factor and the reserve the resultant; the other, the one in which the depreciation reserve is the primary guide to a "proper" amount and the annual depreciation charge is the balancing figure. The author appears to favor the latter view in support of which much of his exposition of the weaknesses of estimating service lives is used.

In addition to the above, the book is a valuable documentation of the conflicting views on depreciation with particular emphasis on the opinions of regulatory bodies as expressed by the NARUC Committee on depreciation and those voiced by the industry through the Edison Electric Institute.

Although the author devotes his short last chapter to a discussion of "Relative Advantages of Available Methods" of depreciation accounting, it is to be regretted that more space was not given to this topic. It seems that Mr. Nash's many years of experience in the field of depreciation could have been used to greater advantage in this phase of the work. It is also to be regretted that the author did not focus his simple and lucid writing ability on the implications of the various depreciation methods, the implications which are often more fundamental than the technical advantages and disadvantages.

In conclusion, it must be repeated that this work is exceptionally well written from start to finish and is a fine exposition obviously made possible by the author's long contact with the subject.—*Joseph Jeming, Financial and Economic Consultant, N. Y.*

AIR CONDITIONING AND ELEMENTS OF REFRIGERATION, by Samuel P. Brown. (Price—$6.00) The McGraw-Hill Book Co.

THIS book is intended primarily as a textbook for students with a high school education who intend to work on the design, installation or operation of heating, ventilating and air conditioning systems. It is not intended for designers of equipment. Little or no knowledge of engineering, science or mathematics is required to understand this text, as each problem is explained fully in elementary language as it arises. The text includes sections on elementary physics, chemistry, algebra and the use of graphs. One excellent practice is that of giving the meanings of symbols directly below the equations in which they appear.

Among the subjects covered are: physical properties of gases, elementary thermodynamics, psychrometry, refrigeration cycles and equipment, refrigeration applied to air conditioning, comfort conditions, heat loss calculations, heating systems, cooling load, fluid

Panhandle Eastern Gets Compressors

First of five type "GMW" gas engine-driven angle compressors loaded on a special flat car before being sent to Panhandle Eastern's Pleasant Hill, Ill., compressor station

flow, piping and duct design, air distribution and controls. The information contained in this book should enable the reader to select and size air conditioning equipment intelligently and to understand catalog information.

It is unfortunate that the author has omitted mention of the lithium bromide refrigeration cycle developed by Servel for air conditioning purposes, although the Electrolux domestic refrigeration cycle is described fully. The diagram of a gas control set-up on page 531 includes several errors. The table on pages 360 and 361 should be corrected as follows:

Residence gas range, giant burner—1,200 B.t.u. per hour
Medium burner—9,000 B.t.u. per hour
Manufactured gas—525 to 540 B.t.u. per cubic foot
Natural gas—1,000 to 1,200 B.t.u. per cubic foot
The term "manufactured" gas should be used throughout instead of the term "artificial."

—J. S. S.

Notes from F. P. C.

The Colorado Interstate Gas Co., Colorado Springs, Colo., has been authorized to construct and operate a pipeline and compressor station and other facilities designed to increase system capacity by 100 million cubic feet of natural gas a day. Designed capacity of the company's present system is 140 million cubic feet a day.

* * *

Cities Service Gas Co., Oklahoma City, has been authorized to construct and operate $23,698,050 facilities to meet increased demands throughout the company's system, primarily in the Kansas City area.

The new facilities will increase the system's sales capacity on days of peak demand by 237 million cubic feet and represent the initial phase of a proposed four-year construction program which would ultimately increase peak-day sales capacity by 360 million cubic feet.

* * *

Southern Natural Gas Co., Birmingham, Ala., has received authorization to construct facilities to increase its pipeline capacity by 39 million cubic feet daily. Present line capacity is 255 million. These facilities do not include any extensions of the company's system to new markets and comprise only construction planned for 1947.

* * *

Northern Natural Gas Co., Omaha, Neb., has been authorized to construct facilities and sell natural gas to Northern States Power Co., Minneapolis, Minn., for resale in St. Paul, South St. Paul, West St. Paul and Rosetown, Minnesota. Service will begin only upon completion of facilities previously authorized which would increase Northern Natural's system capacity to 407 million cubic feet a day. The company expects to realize completion of only 390 million cubic feet of capacity this winter.

* * *

Operating revenues of 81 natural gas companies were $207,322,334 for the first quarter of 1947, an increase of 22.2 percent over the $169,699,038 reported for the comparable 1946 period.

Master Plumbers View Gas Display

Delegates and attendants at A. G. A. booth featuring automatic gas water heater

GAS industry recommendations for adequate water heating facilities were highlighted in a display of the American Gas Association at the National Association of Master Plumbers Home Comfort Exposition which drew 3000 master plumbers to Milwaukee, Wisconsin, May 26-29.

Theme of the display, which attracted widespread attention, was the water heater sizing chart prepared by the Pacific Coast Gas Association and approved by the Water Heating Committee of the A. G. A. Residential Gas Section. Featured were plastic houses in the various sizes on the sizing chart and automatic quick recovery gas water heaters recommended for the houses. The lighting system flickered through the whole series of houses and water heaters to present visually the sizing recommendations. A ten-page mechanical book told the story of the chart and reasons for the recommendations. More than 2,000 copies of the chart were passed out during the four-day convention.

Four girls from the Milwaukee Gas Light Company's home service and sales departments assisted at the booth and passed out additional gas appliance information.

In addition to the A. G. A. display, scores of individual manufacturers presented the latest models of gas-fired appliances and equipment.

S. B. Severson, president of Republic Light Heat and Power Co., Buffalo, addressed one session of the convention stressing the merchandising opportunities for master plumbers in selling and installing modern gas appliances.

International Fuel Economy Conference

PRODUCTION, distribution and utilization of fuels of all types, with special reference to wartime experiences and recent developments, will be discussed at the International Fuel Economy Conference to be held under the auspices of the World Power Conference at The Hague, Netherlands, September 2-9.

The Netherlands National Committee, at whose invitation the Conference is being held, includes Dr. Ir. J. A. Ringers, honorary president; Ir. G. J. Th. Bakker, chairman, and Professor Ir. J. C. van Staveren, second secretary. The program is being arranged in cooperation with the national committees of the 32 other member countries.

The tentative list of papers from the United States is as follows:

"Combined Steam and Electric Supply in New York" by M. J. Steinberg and W. F. Davidson, Consolidated Edison Co. of New York; "Nuclear Energy for Power Production" by W. F. Davidson, Consolidated Edison Co. of New York; "Coal Mining Equipment and Methods in the United States" by Ivan A. Given, editor, *Coal Age;* "Boilers for Special Fuels" by Otto de Lorenzi, Combustion Engineering Co.; "Burning Crushed Low-Grade Coal in the Cyclone Burner" by L. S. Wilcoxson, Babcock & Wilcox Co.; "Natural Gas Reserves in the United States" by a subcommittee of the American Gas Association; "Trends in the Development of Domestic Gas Appliances in the United States of America" by Milton Zare and Eugene D. Milener, American Gas Association; "Advances in Motor Fuel Manufacturing Processes Leading to Better Fuel Economy" by E. V. Murphree, A. J. Blackwood and A. C. Patterson, Standard Oil Development Co., and "Spreader Stokers in the U. S. A." by R. L. Beers, The Detroit Stoker Company.

All inquiries should be addressed to H. C. Forbes, treasurer and secretary, Executive Committee of U. S. National Committee, World Power Conference, 4 Irving Place, New York 3, N. Y.

Manufacturers Offered Technical Assistance

E. A. Jahn

THE American Gas Association has employed a trained gas utilization engineer to provide technical assistance to manufacturers in an effort to improve their equipment. Particular attention will be directed toward counter-type commercial cooking appliances.

Edgar A. Jahn, who joined the Association recently, is now available to assist appliance manufacturers to comply with American Standard Approval Requirements where they exist and guide them in producing efficient and safe equipment where no standards have been set up. His work is expected to be mainly with the smaller manufacturers who do not employ competent research and development engineers.

Member companies of the Association have been invited to submit names of gas appliance manufacturers who may be in need of such technical consultation and assistance.

Mr. Jahn is a graduate of the Polytechnic Institute of Brooklyn where he did post graduate work in heating and air conditioning. After leaving college, he served as a draftsman for the New York Board of Education and a year later as heating engineer with the L. J. Wing Manufacturing Co., New York. He joined The Brooklyn Union Gas Co. in 1937 as an engineer and for five years worked in the Commercial and Engineering Divisions of the New Business Department. From 1942 to 1947 he was field engineer in the Marine Service Department of the Sperry Gyroscope Co. where he performed installation tests and instruction work. During that time he spent one year in Rio de Janeiro helping the Brazilian Navy to organize a repair station and train operating personnel.

SENDOUT GROWTH, THREAT, PROMISE

(Continued from page 318)

covered by our franchise and in whatever volume the customer may desire. We have no reason to fear that the bottom may drop out of this business. The customer's demand has changed from "I want house heating by gas" to "How soon can I get it?"

We recognize of course that with better postwar equilibrium, it will be necessary to develop our business to the greatest possible usefulness to customers and advantage to stockholders. We must more and more bring home to people the advantages of our product and the convenience of our equipment. That will require good advertising. Advertising is our hedge in the transition from a sellers' to a buyers' market.

Advertising as a means of meeting competition has an undoubted effect upon earnings. The gas business was a somewhat slow starter in national advertising, but today individual companies do very well locally and the national advertising program sponsored by the American Gas Association has really done wonders. As you know, the national effort is financed by the contributions of member companies, many of whom are combination gas and electric institutions. The executive of a combination company has quite a problem for he must serve as well as his conscience permits both ends of his business. He may be tempted by the apparently greater returns in the electric business to swing in its favor, yet he must realize that what is best for the customer must in the end be best for his company. He knows perhaps that earnings may be harder to make in the gas business, but he cannot arbitrarily wash out the gas investment for this reason. He knows without doubt that he serves his stockholders best who serves his customers best. Our national advertising has been modest and conservative. We sell not on romance, but on performance. It has been proven before now that extravagant claims in advertising often do the advertiser more harm than good. So the combination company people may well feel that they get real value for their money in their contributions for any development in the gas business.

Of necessity I have rambled somewhat. I certainly had no idea of prescribing a panacea. You are learning through chemistry and other means how to make gas better and how to make it cheaper. You are developing men, machines and methods. New processes are taking up much of your time and are being heavily supported by the contributions of Association members. And along with these comes the study of materials, those used in the gas business and those produced by it. Our prospects were never brighter for the development of by-product markets in many fields. Research is our best assurance for the future.

The gas business with its affiliations is a worthy field of effort. It has rich rewards for those who can earn them. However glorious and bright its history, its future is greater—brighter for the community and for the individual.

Paraphrasing Charles Schwab's remark on the United States, "Don't ever sell the gas business short!"

Convention Calendar

AUGUST

25-27 •Appalachian Gas Measurement Short Course, West Virginia University, Morgantown.

SEPTEMBER

8-10 •Mid-West Gas School and Conference, Iowa State College, Ames, Iowa.

15-17 •National Butane-Propane Association, Annual Convention and Exhibit, Jefferson Hotel, St. Louis.

17-19 •National Petroleum Association, Atlantic City.

19 •Oklahoma Public Utilities Association, Annual Conference, Biltmore Hotel, Oklahoma City.

23 •New Jersey Gas Association, Stacy-Trent Hotel, Trenton.

23-25 •Pacific Coast Gas Association, Hotel Del Coronado, San Diego, Calif.

OCTOBER

2-4 •Mortgage Bankers Association of America, Statler Hotel, Cleveland (A. G. A. will exhibit).

6-8 •A. G. A. Annual Convention, Cleveland, Ohio.

6-8 •Association of National Advertisers, Annual meeting, Atlantic City.

6-10 •National Safety Congress & Exposition, Chicago.

16-17 •Texas Mid-Continent Oil and Gas Association, San Antonio.

20-24 •National Metal Congress & Exposition, Amphitheatre, Chicago (A. G. A. will exhibit).

21-23 •American Standards Association, Waldorf-Astoria Hotel, N. Y.

NOVEMBER

10-14 •National Hotel Exposition, Grand Central Palace, N. Y. (A. G. A. will exhibit).

13-14 •Mid-Southeastern Gas Association, Annual Meeting, Sir Walter Hotel, Raleigh, N. C.

DECEMBER

1-5 •American Society of Mechanical Engineers, Annual Meeting.

Accounting Section

Depreciation Dispersion Factor

BY A. W. HASTINGS

Rockefeller Brothers, New York, N. Y.

HAS research lowered the sights on what the depreciation reserve requirement would be on utility plant? I shall answer that question directly.

It is true that results of recent research directed toward new methods of discovering the facts about depreciation of utility property have tended to minimize depreciation requirements computed on an age-life basis.

First, let's get some words straightened out so that we all understand what we mean. Depreciation, as used in this discussion, is essentially the collection over its life of the net cost of property, that is, cost less the net salvage value that will be realized upon its retirement over the period corresponding roughly with the time that the property is in use. If we omit the application of interest in this phase of the discussion, we can describe the annual depreciation charge very simply and specifically. It is the net cost divided by the estimated life in years. The accrued depreciation or the depreciation reserve requirement is the age at any date divided by the life, times the net cost. Hence the name "age-life." This is the classical concept of age-life depreciation. It is simple, direct and understandable. Note particularly that nothing is said about value. To illustrate, having an item of property costing $1,000 which the engineers estimate will last for 40 years, with no net salvage, we must collect $25 a year in order to have recovered the cost by the time the unit is retired.

Group Accounts

Now, that computation is easy to make as applied to single units of property such as a turbo-generator unit, but when we try to apply it to a large utility property problems arise. The bulk of our property—at least 60 percent of it—is made up of thousands of units of poles, wire, transformers, meters, etc. These are recorded in our group accounts. If we were obliged to estimate and follow individual units of property in the group accounts, the work would be tremendous. The plant accounting men already use averages for charging all kinds of property into the group accounts and we might be expected to deal likewise with averages in depreciation computations. However, you will see that very large error arises by dealing with simple averages in depreciation. Why? Because some of the units in a group account which would appear to have identical life expectancy when they are installed will be retired well before the average life and some long after. We call this phenomenon "dispersion." Perhaps I can illustrate best by drawing three diagrams, commonly called "survivor curves," which give a graphical picture of dispersion.

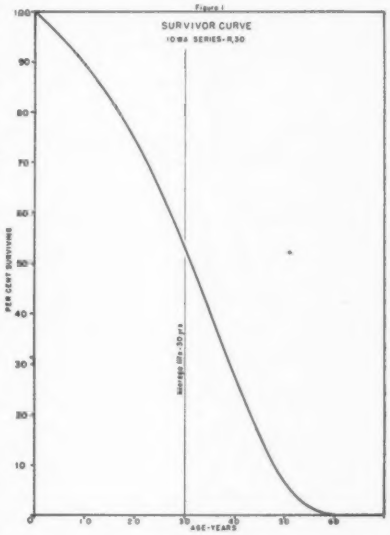
(See Figure 1), the vertical axis shows the percent surviving at each age out of the original group, and the horizontal axis shows the age or elapsed time in years.

These survivor curves are also referred to as "mortality characteristics" because they presumably show the way the property has "died" in the past. The term is borrowed from life insurance actuaries' vocabulary. Now, armed with an understanding as to what we mean by some of these terms—depreciation, age-life, dispersion, survivor curve, mortality characteristics—let's turn back a bit.

Historically there has been bitter opposition to age-life depreciation studies and the entire age-life approach in several quarters in the utility industry. This opposition may have sprung from the fact that age-life depreciation as it has been applied has frequently produced unrealistic and excessive reserves as compared to existing reserves or as compared to engineering estimates of accrued depreciation. Many utility executives have been more willing to fight age-life depreciation than to try to understand it and to recognize the abuses that have been perpetrated in applying it. Properly applied age-life principles do not necessarily produce unreasonable reserves; moreover, they represent about the only approach to determining depreciation which is generally satisfactory to regulatory authorities. It is not an extravagant statement to say that most utilities are going to have to face some kind of age-life yardstick for setting up depreciation before too many years have passed. The Depreciation Committee has been urging that we should know as much about these methods as the regulatory authorities who are attempting to apply them, in some cases without understanding their frailties.

If we can meet the regulatory authorities on the own ground, we must understand the proper application of age-life methods.

In what way has recent research been helpful? The answer is, better methods of analyzing mortality characteristics in a broad field have led to the discovery that dispersion is greater than had been thought.

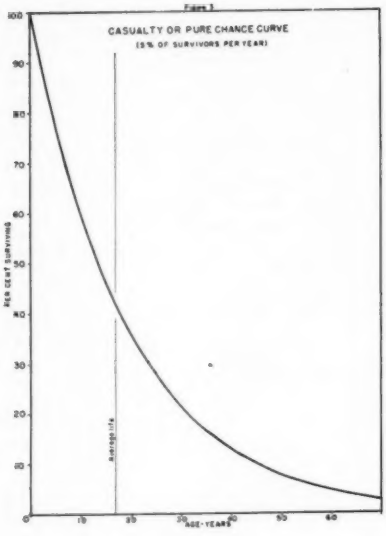


Let's try to understand dispersion a little better. Keep in mind that we are talking only about group accounts. If there is no dispersion, that is all retirements occur at the average year, we have what is known as a square type Survivor curve. (See Figure 2.) On such a curve the age divided by the estimated life would represent the accrued depreciation percentage, assuming of course that we continue to ignore interest. But what is the situation when there is dispersion? If we use the same approach of dividing age by life with respect to mass accounts we ignore the fact that substantial retirements have actually taken place from the group and, in

Presented June 2 during Edison Electric Institute Annual Convention in Atlantic City, N. J. Contains information of vital interest to both electric and gas utility accountants.

practical accounting, have been charged out against the depreciation reserve prior to the average life. It follows that a reserve requirement computed on the simple ratio of average age divided by life will *overstate* the reserve requirement by the amount of these early retirements. To make the matter even clearer, examine another curve which represents an extreme case. (See Figure 3.)

This curve represents what the survivors would be if the retirements are the same percent in each year of the actual plant that remains in use, in this case five percent. The



curve is called the casualty curve or pure chance curve, since under the assumptions made, age has no effect on the likelihood of retirement. We discover that the retirements in each year exactly equal the accrual for depreciation which is required. Under such conditions no reserve accrues and none is required. This represents an extreme case at the other end of the scale from the square type curve.

The general conclusion reached is that the greater the dispersion (the flatter the survivor curve) the lower will be the reserve requirement for a given age-life ratio.

With this explanation of the effect of dispersion, let's look at the research work that has been going on to determine dispersion of utility property. How is dispersion determined? I will not answer that question here. The Depreciation Committee in 1942 issued a treatise entitled, "An Appraisal of Methods for Estimating Service Lives of Utility Properties." At the time that volume represented the latest knowledge on this subject. It is an extensive treatise. The volume showed, among other things, that at that time the actuarial methods were the only known methods to discover the dispersion shape. Only a few utilities have available the very extensive information required to make a determination of the shape of the dispersion curve and even then they usually have this extensive data for only a few of their group accounts.

Therefore, depreciation engineers have been faced with this problem: they could not omit the effect of dispersion without seriously over-estimating the reserve requirement; they could not determine the shape of the dispersion curve. What they usually did do to avoid the substantial error from entirely omitting the dispersion factor was to estimate a curve shape and apply it. In most cases the estimate was a pure guess and frequently that guess was a steep curve with low dispersion, that is, a curve approaching the square type (Figure 2). Such curves produce high reserve requirements. If no dispersion adjustment is made this is equivalent to selecting a square type curve.

Now to digress for a moment. In 1939, the Depreciation Committee started a research into the causes of retirements. They analyzed the figures of several companies over their entire history, going back to actual records of retirements, to determine the causes. The labor involved was tremendous. They finally concluded that approximately 80 percent of the property studied had been retired for functional not physical causes. Property was not worn out or rusted out but still physically usable; it was either obsolete or inadequate, or it had to be removed because of government orders, such as the requirement to go underground with a distribution system, or the widening of a road, or the like. This is a very important conclusion in its effect on dispersion. Now let's review the functional causes of retirement to see why this is so.

Obsolescence is the first functional cause of retirement noted. It is determined by engineering study which must contain a large ingredient of executive decision. Property is obsolete when it is more economical to replace it with modern equipment than to continue to maintain and operate the old. Obsolescence was a major cause in the early period of utility development, particularly before 1930, because of rapid advances in the art during that early period. It has recently declined in importance as a cause of retirement because of a greater standardization of equipment, and the higher price level at the present time also comes in to affect the obsolescence equation.

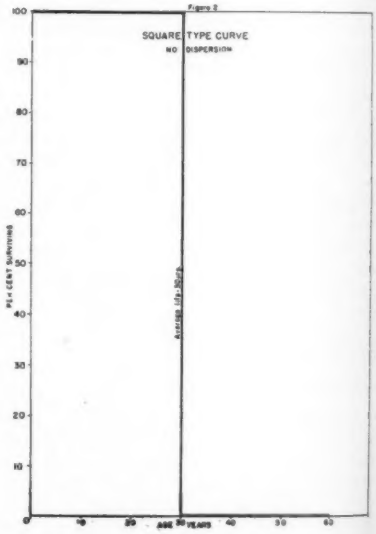
The second major cause of functional depreciation is inadequacy. This cause is self-explanatory; growth of load makes it necessary to replace with larger capacity. Again the element of executive judgment comes into the picture. Note that these judgments in both cases, and particularly in the second case, are not related directly to the age of the property and suggest that *chance* may have considerable to do with these reasons for retirement—chance unrelated to the age of the property.

The third major functional cause cited is the order of governmental authorities. This cause of retirement is obviously in no way related to the age of the property and again, from the statistical approach at least, is largely chance. It might be expected from these studies that the actual mortality curves of the utility property would show a considerable leaning toward the casualty or chance curve, which is a concave curve as shown on the board. This is the ingredient in the mortality picture which engineers failed to give enough attention to, that causes flatter curves than those that had been fairly generally estimated in the earlier studies of mass accounts.

There are other causes of retirement not related to functional causes that include casualty effect, such as lightning damage, affecting particularly transformers, and breakage, affecting transformers and meters. Breaking down poles by traffic accidents is another example. None of these physical causes of retirement is related to age and they also contribute to the casualty shape of the curve.

Looking back, one wonders why depreciation engineers did not suspect even earlier than they did that the steep curves which they were estimating were wrong.

Since 1942 when the "Appraisal of Methods" treatise was issued, there has been a new development in discovering mortality characteristics from accounting figures which permits an actual determination of the dispersion or mortality curve shape in a large number of cases without the detailed records heretofore held essential for determination by the actuarial method. This new technique is called the Simulated Plant Record Method. The major work in developing the method was done by Alex. Bauhan of Public Service Electric and Gas Co., Newark.



Working independently, Henry Whiton of Gulf States Utilities Co. developed a similar procedure. Both procedures were discussed at the Buffalo meeting of the Accounting Section. Paul Jeynes, also of Public Service, outlined a further procedure at the Buffalo meeting that may have particular application in some cases.

I will not attempt to describe these new methods except to point out that they are

all variations of one procedure; they consist in assuming a mortality curve, applying the curve to the gross additions for each year, and comparing the survivors or retirements computed by this means with the actual survivors or retirements. The trial assumption that comes closest to the actual figures is selected as the best representation of the dispersion curve. It is obvious that all that is necessary is a record of the actual gross additions and the actual retirements or survivors at the end of each year over the history of the account. The important fact is that by this method of analysis we have been able to develop the facts of dispersion about a lot of property concerning which formerly we could only guess and the facts so developed show much more dispersion than we had been estimating.

Another fact apparent from these new studies is that there is no uniformity in the curve shapes for the same kind of plant located in different properties. This would lead the thoughtful student to review the causes of retirement, and confirms the view that the attitude of the management about retirements of property in various locations, as well as a difference in physical conditions, has a profound effect on curve shape.

In the beginning I excluded interest from this discussion for simplicity's sake. I would say now that these same effects are equally present if interest is introduced into the depreciation computation.

Summary

The shape of the mortality characteristic drastically affects the size of the reserve of a group account. The reserve can vary all the way from zero to the full age-life ratio. The discovery of new methods of determining dispersion characteristics has brought us information that we were unable to get before and has shown that mortality curves are flatter than we had supposed, with correspondingly lower depreciation reserve requirements.

So much for dispersion. I cannot resist mentioning a second factor affecting the size of the reserve. That is the question as to whether in applying age-life principles any allowance should be made for interest. This subject has been and still is highly controversial within and without the industry. The N.A.R.U.C. discusses it at length in its several reports on depreciation policy proposed for adoption by the association, none of which was ever officially adopted. They have taken a position in favor of straight-line depreciation and against the inclusion of the interest factor. This position has been strongly criticised by engineers. Note particularly the official report of the American Society of Civil Engineers dated April 15, 1944, entitled "Principles of Depreciation"—Report of the Special Committee Authorized by the Board of Direction to Analyze and Discuss the 1943 Report of the National Association of Railroad and Utilities Commissioners' Committee on Depreciation. Bear in mind that the engineer approaches the problem from a value standpoint and to him omission of the interest factor is economic nonsense. The whole utility industry is regulated on the basis of fair return on fair value and it seems inconsistent and illogical in any case to omit interest when computing one of the major factors in a fair return computation.

The introduction of interest into the depreciation equation always reduces the reserve requirement and in most cases the annual charge also when applied to the average utility property. Quantitatively the introduction of interest frequently results in reduction of from one-third to one-half in the depreciation requirement as applied to a normal utility property where the interest factor is taken at the rate of return.

I conclude with one more plea to the industry to give depreciation its proper weight and importance in the utility picture. Depreciation is a management problem; it is the responsibility of utility executives, not of technicians isolated from management responsibilities. Management decisions affect the life and curve shapes of the property. The elements of the depreciation problems are simple and should be clearly understood by those responsible.

Perhaps the most important thing to be learned from studying depreciation is that all the methods and routines used have weaknesses and are based on assumptions such as, for example, the assumption that property will be used and retired in the future on the same pattern as in the past. Depreciation figures relating to existing property are essentially estimates of future performanace and should always be treated as such. Nor should the frailties of method and assumption ever be lost sight of. However, in my humble opinion it will do no lasting good to fight age-life depreciation on the basis of its defects until there is developed a better method satisfactory to regulatory authorities and to responsible management officials. Both are looking for a simple authoritative answer or yardstick which probably does not exist.

INDICATIONS OF AN ORIFICE METER

(Continued from page 341)

any (accidental) inlet corner curvature should not exceed 0.001 inch.

Both Report No. 2 and Flow Measurement specify that the inlet edge (corner) of an orifice shall not appreciably reflect a beam of light when viewed without magnification. Considering the consistency which some engineers have reported in their calibrations of relatively small orifices, (say two inch x 0.5 inch) the inlet edges of which appeared to meet this requirement, it is believed that this specification is adequate for insuring the necessary squareness of the inlet corner of an orifice.

Acknowledgments

As stated in the introduction, the tests here reported were performed by four of the meter manufacturing companies as a contribution to the research program of the Gas Measurement Committee. The carrying out of these tests doubtless interfered with the normal production work of these companies and required special effort on the part of some of the companies' engineers. So far as the writer is aware, there has been no acknowledgement of the contribution made by these companies except such as may possibly have been voiced informally at a committee meeting. While he was not formally delegated to speak for the committee, he feels confident that the members of the Gas Measurement Committee will join him in acknowledging with appreciation even at this late date, the efforts of The Metric Metal Works, The Foxboro Co., The Bailey Meter Co., The Pittsburgh-Equitable Meter Co., in performing these tests.

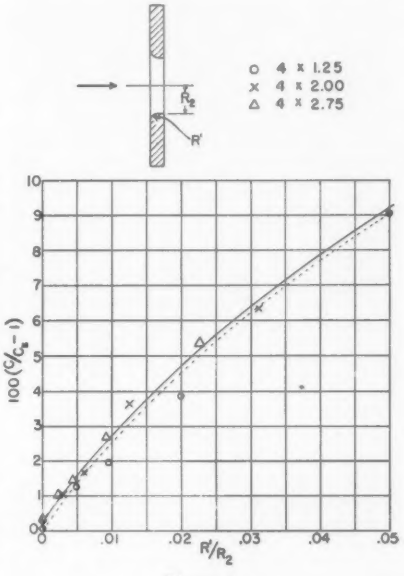


Figure 7

1. The Effects Upon Orifice Meter Indications of Various Pipe Fittings near the Orifice, H. S. Bean, Western Gas, March 1929, p. 30.

2. Work of the Gas Measurement Committee, Natural Gas Department, American Gas Association, H. S. Bean, Proc. Southwestern Gas Measurement Short Course, April 1931.

3. Values of Discharge Coefficient of Square-Edged Orifices, H. S. Bean, AMERICAN GAS ASSOCIATION MONTHLY, July 1935, p. 259.

4. A Review of the Installation Requirements for Head Meters, H. S. Bean, Proc. Appalachian Gas Measurement Short Course, University of West Virginia, August 1941, p. 270.

5. The History of Orifice Meters and the Calibration, Construction and Operation of Orifices for Metering, Publication by the American Society of Mechanical Engineers.

6. Report No. 2 of Gas Measurement Committee, A. G. A. Natural Gas Department.

7. Flow Measurement, 1940, A. S. M. E. Power Test Codes, Instruments and Apparatus, Part 5, CH. 4, Flow Measurement by Means of Standardized Nozzles and Orifice Plates.

8. Determination of the Effects of Certain Installation Conditions on the Coefficients of Sharp-Edged Orifices, S. R. Beitler and J. E. Overbeck, Trans, A. S. M. E. Vol. 59—No. 2, Feb. 1937, p. 115.

9. Discharge Coefficients of Square-Edged Orifices for Measuring the Flow of Air, RP49, Bureau of Standards Journal of Research, Vol 2, March 1927, p. 561.

Residential Gas Section

WALLACE M. CHAMBERLAIN, Chairman | C. S. STACKPOLE, Vice-Chairman | F. W. WILLIAMS, Secretary

N. Y.-N. J. Regional Sales Conference

J. P. Hanlan, chairman

PLANS and programs that will spark the gas industry's drive to retain and enlarge the domestic gas load were presented to 200 eastern sales and advertising executives at the New York-New Jersey Regional Gas Sales Conference June 23-24 at the Essex-Sussex Hotel, Spring Lake, New Jersey. Under the sponsorship of the Residential Gas Section of the American Gas Association, the meeting directed attention to national kitchen and laundry gas load-building activities.

The business of the conference was punctuated with glowing tributes to the chairman, James P. Hanlan, gas sales manager, Public Service Electric & Gas Co., Newark, N. J., who retires July 1 after many years of sales leadership in the gas industry. It was a "repeat" performance for Mr. Hanlan who was chairman of the first New York-New Jersey conference in 1925.

W. B. Hewson, publicity and advertising manager, The Brooklyn Union Gas Co., was elected chairman of the 1948 Sales Council to succeed Mr. Hanlan. Walter G. McKie, manager, domestic sales department, Rochester Gas and Electric Corp., was named vice-chairman, while James A. Sackett, Kings County Lighting Co., Brooklyn, and Robert B. Denhardt, Central Hudson Gas and Electric Corp., Poughkeepsie, were selected for the Executive Committee.

The gas industry welcomes salesmanship almost more than any other activity, H. Carl Wolf, A. G. A. managing director, told the conference in his opening remarks. It is indispensable to our success, he said, adding that no one had shown more consistent salesmanship over the years than Mr. Hanlan.

Opening a four-pronged symposium on the New Freedom Gas Kitchen Program, Mr. McKie described the activities of the Rochester Kitchen Center where modern ventilated gas kitchens are displayed and a complete planning service offered. More than 50,000 visitors have passed through the center in the 14 months ending June 1, 1947, he reported, adding that requests for the kitchen planning service are increasing. He stressed the importance of promoting kitchen ventilation and pointed out that this feature of the kitchen center attracted more attention than any other.

The next speaker, Martin Gibbons, supervisor, kitchen program, The Brooklyn Union Gas Co., explained how his company has sold 175 complete gas kitchens and $180,000 worth of equipment through a cooperative plan. The company does not sell kitchens direct but supplies leads and sales aids to two cooperating firms who deal directly with the customer. Mr. Gibbons strongly recommended the policy of utilizing cooperative dealers as contrasted to direct selling.

Since the kitchen is a woman's domain, feminine logic is needed to help plan and promote the New Freedom Gas Kitchen idea, Evelyn Kirkpatrick, kitchen planning consultant, Boston Consolidated Gas Co., told the conference. Home service can be a most valuable asset in any kitchen promotional program, Miss Kirkpatrick pointed out, because war shortages caused increasing numbers of women to turn to home service for answers to their domestic problems. She described the four unique kitchens, each in a different style, which have been designed for the Boston utility's display floor.

Summing up the New Freedom Gas Kitchen discussion, H. Vinton Potter, director, A.G.A.–G.A.M.A. New Freedom Gas Kitchen Bureau, said "heretofore we have sold an idea, now we must merchandise it." As a potent tool for the selling phase of this program, Mr. Potter announced a Certification Program for new construction as well as for home remodeling. Under this program a certificate from the bureau will be presented for kitchens which meet the four requirements of (1) scientific planning for step-saving, time-saving, work-saving convenience, (2) contain an automatic gas range

W. B. Hewson, chairman-elect

W. G. McKie, vice-chairman-elect

built to "CP" standards, (3) a gas refrigerator, and (4) an automatic quick-recovery gas water heater.

The New Freedom Gas Kitchen Certificate will serve as a consumer buying guide, Mr. Potter said, as well as an endorsement of the builder's good judgment in selecting a unified kitchen for his prospect. He displayed a presentation manual on the program which is being distributed to key personnel in the gas industry.

In an enlightening address, R. J. Canniff, advertising and sales promotion manager, Servel, Inc., traced the pattern of salesmanship in the American business system and concluded that this pattern needs only slight adjustment to meet the challenge of the highly competitive postwar era. He called for the issuance of more factual material on products through negotiated publicity, more tangible results from advertising, and more sales training to provide the necessary sales power.

Mr. Canniff expressed concern that the utilities' sales departments are only 30 percent manned while the manufacturers are ready for mass production of appliances as soon as materials become available. Giving his own company as an example, he declared that gas refrigerator production today is in excess of the 1941 rate. "We hit a record production level of 2,000 per day recently," he said.

E. Carl Sorby, vice-president, George D. Roper Corp., concluded the Monday morning session with an eloquent plea for the gas companies "to set your selling organization in tune with the finest cooking vehicle of modern times, the automatic 'CP' gas range." While eyes today are on production, they will soon turn to selling, he said. He illustrated his remarks with a set of moving gears which emphasized "the terrific potency of selling" and its indispensable part in a going organization.

A three-way merchandising analysis of the home laundry business and its potential effect on gas load occupied a major portion of the Tuesday program. The initial speaker was M. R. Rodger, utility sales manager, Bendix Home Appliances, Inc., who cited the tremendous opportunity for new gas sales in supplying hot water for the automatic washers and in supplying fuel for gas dryers.

His own company's automatic washer, Mr. Rodger said, consumed approximately 20 gallons of hot water per cycle and required water temperature from 145 to 160 degrees for best results. A survey indicated that the average number of loads washed was 6.7 per week and that the average load weighed 7.8 pounds. He estimated that the average home laundry revenue for the gas industry would amount to $13.80 of which $6.55 would come from water heating and $7.25 from the gas dryer.

Importance of the gas dryer in the promotion of gas service was stressed by Morgan L. Busch, Hamilton Manufacturing Co., who called it the first major new domestic gas appliance to be developed in 20 years. The dryer conveys the idea of modernity and in addition carries the water heater load with it in most instances.

Modern Features

The gas unit can dry a full load in 15 to 25 minutes, has automatic clock control, is easy to service and has 190 degree maximum heat which kills bacteria in the clothes, Mr. Busch asserted. Its maximum input is 20,000 B.t.u.'s per hour. He expressed the opinion that of his company's total sales, 70 percent would be gas dryers compared to 30 percent electric, due to the fact that gas units have a lower operating cost and are cheaper to install. They must be demonstrated to be sold, Mr. Busch declared, pointing out that the New Haven Gas Light Co. recently installed 25 driers on approval and none returned.

The case for promotion of the modern gas laundry was summed up with force and clarity by the third speaker, Frank McFerran, general sales manager, Ruud Manufacturing Co., who said this profitable load should not be allowed to go by default. He pointed out that 3.5 million washers are sold each year, representing a large percentage of the company's customers. We have an obligation, he added, to provide them with adequate automatic gas water heating service.

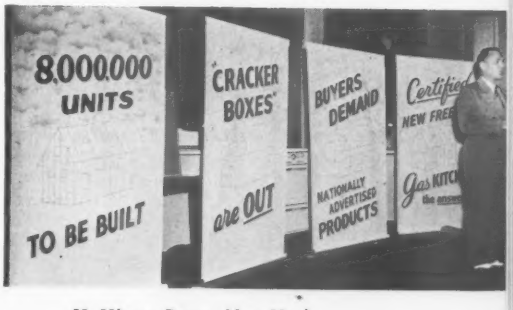
Mr. McFerran reiterated Mr. Busch's viewpoint that the dryer would follow the water heating load and estimated that modern gas appliances in the home laundry would add from 1,000 to 3,000 cubic feet per month new load. He urged utilities to set up proper standards of quantity, quality, temperature and installation in promoting gas water heaters. Larger-sized water heaters and broader temperature ranges are needed to supply the modern automatic washers, Mr. McFerran stated. In his opinion, two million automatic gas water heaters will be sold in 1947 as compared with 1,250,000 in 1946 and 750,000 in 1941.

Turning the spotlight to domestic cooking, W. B. Hewson, member of the A. G. A. National Advertising Domestic Copy Committee, described a strong new short-term ad-

Evelyn Kirkpatrick, Boston

Frank McFerran, Pittsburgh

E. Carl Sorby, Rockford, Ill.

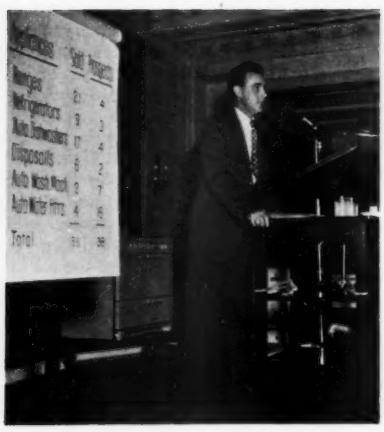


H. Vinton Potter, New York

A. C. Fox, Pittsburgh

M. L. Busch, Wisconsin

M. R. Rodger, South Bend



Martin Gibbons, Brooklyn

R. J. Conniff, Evansville

vertising campaign which will break this fall in national magazines, accompanied by a coordinated drive to promote automatic gas cooking. Spearhead will be 98 million advertising messages in ten national magazines—three insertions each from late September through December. This compares with 40 million messages in the same period of 1946.

Blueprint for this special high-pressure campaign which involves a $200,000 expenditure by A. G. A., will be the nine points on which women base their range choices as revealed by the recent Roper survey, namely: (1) automatic operation, (2) more modern conveniences, (3) clean range and kitchen, (4) easy to cook on, (5) cooks food better, (6) cooks foods faster, (7) cool range and kitchen, (8) least cost to operate, and (9) least cost to buy. Theme of the powerful, hard-hitting advertisements will be "Gas Has Got It!"

Mr. Hewson urged local gas utilities to run at least one large newspaper ad each of the three months following closely the theme and appearance of the national ads and to stress the "new" story in radio, car cards, truck panels, direct mail, outdoor posters and other media. These "shock tactics" should have a marked influence on women's attitude toward gas cooking in 1948, he added.

Final program feature was an inspiring address by A. C. Fox, Fuller Brush Co., Pittsburgh, entitled "There's Gold in Them Thar Doorbells." An exponent of direct door-to-door selling, Mr. Fox regaled his audience with many selling anecdotes interlarded with valuable advice on salesmanship technique.

Housewives are the greatest group of purchasing agents, Mr. Fox said, and the home is an ideal setting for sales. Selling is a scientific process, he added, and every sale is made in the mind, first in the seller's mind and finally in the buyer's mind. He stressed the vital necessity for adequate preparation and the proper attitude on the part of salesmen.

The ideal salesman should have every positive qualification including likeableness, joviality, audacity, pioneering spirit, resourcefulness, restraint, altruism, industry, teachableness, ambition, and "know how." All progress is the result of a sale, Mr. Fox continued, and "manpower is the greatest undeveloped power in the world."

Texas Gas Appliance Dealers Meet

Harriet Pruitt, left, and Julia Hunter demonstrating new gas range to dealers

APPROXIMATELY 150 gas appliance dealers from north and east Texas attended a dealer meeting in Dallas recently, sponsored by Guenther Gas Appliances. R. R. Guenther presided at the meeting which had as its theme, "In Time of Peace Prepare."

The program opened with a sales-slanted demonstration of a new gas range presented by Julia Hunter, Home Economics director, Lone Star Gas Co., Dallas, assisted by Harriet Pruitt, home economist for the Dallas Division of Lone Star. The demonstration included complete meals from the oven, top burners and broiler, pointing out the accuracy, simplicity, speed and beauty of the gas range. Wayne H. Bovee, Hardwick Stove Co., demonstrated correct methods of presenting new gas ranges to prospective customers, stressing the importance of telling the customer what the range would do for her. E. I. Jones, Handley-Brown representative, Jackson, Mich., explained new water heater models, sizing and selling points.

Preceding a luncheon, Mr. Guenther held a brief discussion on New Freedom Gas Kitchens.

Gas Heating Contest

SINCE original announcement in the MONTHLY of the new annual Gas Heating Progress Contest to be conducted by the American Gas Association and sponsored by The Coroaire Heater Corp., the final date which entries must be postmarked has been changed to "not later than July 30, 1947." Originally the date had been set at June 30, 1947. Entries should be addressed to the American Gas Association, 420 Lexington Avenue, New York 17, N. Y.

School Replacement Plan For Gas Ranges

CRIBBEN AND SEXTON CO. has announced to dealers and utilities a plan to provide installation and replacement of its gas ranges in Home Economics Departments of educational institutions.

Under the program, schools can purchase the company's gas ranges from their dealer or utility at approximately 50 percent of the retail list price. This includes installation and servicing. The ranges will then be replaced periodically at no charge to the school. The replacement period is determined between the school and dealer or utility with minimum period one year and maximum three years. The agreement runs for six years, and can be continued longer by mutual agreement.

In support of the program, Cribben and Sexton will sell ranges to dealers or utilities at a special school discount.

The plan is designed to support the American Gas Association's teacher's manual and motion picture film, "Winning Seals of Approval."

Women's Club Programs

THE first issue of *Agenda*, new magazine for women's club program planners, carries an eight-page outline entitled, "The Wonder Flame That Cools as Well as Heats." This is the first of a series of planned programs to be presented by the Servel Homemaker's Institute to stimulate interest in Home Service departments among women's clubs.

Agenda is being offered to the program planning leader in each representative local group with useful suggestions for "tailor-made" programs. The inserts are prepared by Servel in cooperation with the American Gas Association. First club demonstration program is devoted to an introductory study of gas, gas service equipment and an examination of the benefits brought to homemakers by utility Home Service departments.

Spectacular mass exhibit of 20 of America's finest makes of gas ranges on main display floor of The Gas Service Co., sponsored by 26 Topeka dealers

Virginia Tullis, Home Service director, Birmingham Gas Co. (right), with assistant Roby Sanders, Miles College graduate, and housewives participating in utility's cooking school

Kermit Schofer, Caloric Stove Corp., building gas range before the eyes of crowds attending Pathfinder Week in Stroudsburg, Pa. Well promoted, the demonstrations were held twice daily with details broadcast by sound truck

Guests at fiftieth anniversary party for American Stove Company's Harvey, Ill., factory included pensioners, senior employees, contest winner and oldest "veteran" gas range which has required neither repairs nor replacement of parts during 45 years of constant use

American Home Economics Convention

American Gas Association display at convention which attracted 2,000 home economists to St. Louis June 23-26. Pictured at booth are: left to right: Thelma Bell, Home Economics Department head, Harding College; Gloria Gaupp, A. G. A.; Grace Johnson, Harding College student; Gertrude Austin, American Institute of Baking; Clifford E. Hall, A. G. A.; Ruth Soule, Home Service director, The Brooklyn Union Gas Company

Peoples Gas Home Service Department Celebrates 25 Years of Progress

THE Peoples Gas Light & Coke Co., Chicago, celebrated this year the twenty-fifth anniversary of its Home Service Department, believed to have been the first Home Service Department of its kind in America. An attractive illustrated pamphlet commemorating the event points out some of the many strides which Home Service has taken since its founding in 1922.

Martha Holmes, Home Service Director, and a staff of professional home service economists now conduct "what is recognized as headquarters for dependable, easily understood advice about recipes, meal planning and home making in general."

The department has built up at its downtown headquarters on Michigan Avenue elaborate files of tested recipes, a telephone recipe system and a laboratory testing kitchen. Visitors may also inspect a dozen full-sized model kitchens in adjoining rooms. Several other home service community offices are maintained in the city. Annual activities include classes before women's clubs and church groups, and each spring and fall giant cooking classes in neighborhood theaters where all-gas kitchens are erected on the stages.

During the 25 years of the department's existence, 18 million requests for recipes have been handled. In one holiday season alone, Martha Holmes and her staff advised 5,200 women on all phases of meal planning.

New Tampa Sales Floor Kitchen

Teachers, students, employees and their families were invited to the opening of Tampa Gas Company's New Freedom Gas Kitchen by Mary Dorn, home service director

Portland Prospect Plan

THE recently revived "tip plan" of Portland (Ore.) Gas & Coke Co. achieved a good start during April and May with $427 paid for 350 range and water heater sales to prospects not previously known to the Commercial department. Names were submitted by employees and their families.

Sales count whether made by the company or through authorized dealer or plumber and whether the appliance is new or used. For the present the promotion is limited to ranges and water heaters.

With a "horse race" as the theme, the plan was announced through the utility's house organ, *The Blue Flame*, and a colorful folder mailed to the homes, including such catch-lines as "They're off. . . . . Place your bets. . . . . Get in on the winnings."

The "Bets" or prospects "pay off" at the rate of one dollar net for each appliance sale. A prospect is good for a 60-day period, provided it observes the "rules of the track," an important one being that the prospect is not a duplicate and has not been worked by a salesman. Provision is made, however, for re-activating a prospect if it shows new life.

As before the war, the prospect plan is operated by the Commercial Department which maintains contacts with the other departments through team captains.

Hartford Gas Meeting

Mrs. Arra S. Mixter (second from left), home service director, and luncheon speakers

A COMPACT and interesting program held the attention of 152 home economists attending The Hartford Gas Company's annual home economics conference on May 21. The meeting was the third annual conference arranged by Mrs. Arra S. Mixter, Home Service director of the Connecticut utility.

Following an attractive smorgasbord dinner the program of four speakers was introduced. Helen A. Smith, assistant to the dean and lecturer on household equipment and foods at Syracuse University, discussed "Business Techniques and College Teaching." Dr. Henrietta Fleck, chairman, Home Economics Department, New York University, outlined "The Job Ahead." Lee Cooley, director of Television, McCann-Erickson, Inc., New York, predicted transcontinental television within three years. Final speaker was H. Vinton Potter, director, New Freedom Gas Kitchen Bureau of the American Gas Association, who spoke on "The Flame of Freedom."

The conference was also featured by exhibits of New Freedom Gas Kitchens, a nutrition display and showing of the latest gas appliances.

Meeting Commercial Competition

BY CHARLES C. HANTHORN

Supervisor, Hotel and Restaurant Division, The Philadelphia Gas Works Co., Philadelphia, Pa.

Charles C. Hanthorn

THE gas industry has done a splendid selling job of educating those in the home and in industry to the advantages of using gas equipment. But I do not believe we realize how thoroughly the job had been done. Today, throughout the country many gas utilities are in dire need of larger distributing systems and production plants. Also, in many cities temporary curtailment in the sale of gas for some uses has been necessary to provide sufficient supply to meet the increased demand for customers already on our lines. I consider these temporary curtailments not a retreat, but a breathing spell to strengthen our forces for the long, hard advance coming in the future.

Part of the increase in gas sales is credited to the commercial load, which in most large cities is second only to the residential load. It is a most important load, as there is very little fluctuation of usage during the four seasons. The hourly demands are such that our distribution system is not affected at any hour of the day or night. Actual tests have shown that the hourly gas usage in restaurants is as follows: from 6 A.M. until 8 A.M. —ten percent, 8 A.M. till noon—30 percent, noon until 2 P.M.—15 percent, 2 P.M. until 6 P.M.—20 percent, 6 P.M. until 8 P.M.—ten percent, and 8 P.M. until 6 A.M.—15 percent.

When we plot a domestic load we find that the commercial cooking load fills up the gaps in the domestic load, helping to make a more efficient production and distribution system. This in turn provides lower manufacturing costs. The cost of rendering bills on commercial gas per thousand cubic feet is lower, as the average commercial bill is over ten times that of a domestic bill. The average cost to service domestic appliances yearly is 75 cents, while the average cost to service commercial appliances is $1.35. Although the average cost per thousand cubic feet of commercial gas used is lower than the average cost of gas sold for domestic use, it is still considerably higher than the average cost of industrial or heating gas.

I do not believe we in the industry realize the promotional value of this load. What better publicity could any product receive than the publicity commercial gas cooking equipment gives the gas industry? Every day millions lunch at the counter and watch the short order cook make perfect griddle cakes, grill hamburgers, fry eggs. What is more dramatic than to watch the magic flame under a glass coffee maker! Our industry has never had to pay one cent for this advertising. Yet many industries pay out thousands of dollars monthly in salaries, for demonstrations and samples, that the public may have the opportunity to test their product. Restaurants, hotels, hospitals, institutions, industrial cafeterias, and schools use our product daily and know of its dependability.

Summarizing what the commercial gas load means to the gas industry, we see that:

1. It is a uniform, 12-month a year load.
2. It helps fill in off-peak hourly demands in distribution and production.
3. The cost to service this load is lower per dollar of revenue than any other load on our lines.
4. The revenue received per dollar of capital investment is greater than on gas sold for other uses.
5. The commercial load is probably the best advertisement the gas industry has.
6. Each year thousands of apprentice cooks are trained under experienced chefs in commercial establishments using gas equipment. What better demonstrators that gas is the ideal fuel for cooking!
7. The revenue received from the commercial load in large cities is second only to the domestic load revenue.

You can visualize what would happen to our industry if this business were lost.

In the commercial cooking field, where 98 percent of our customers use gas for cooking, our competitors are organized as never before. After many years of hard work planting small installations here and there, without discovery until after the damage was done, they are ready to use their landing craft and parachute troops. Proof of this is shown by their increased expenditures in trade journal advertising and enlarged sales forces. This in some locations includes the services of food consultants who not only plan your kitchen for you but supervise its operation after installation. It is their duty to try to eliminate help, reduce serving portions and see that the equipment is turned on and off as required. This saving in help and food is necessary to overcome the increased operating cost of competitive equipment. In certain areas free service is offered their commercial cooking customers. Their enlarged sales forces are well-trained. They know their product and frequently have at their disposal demonstration trucks and kitchens.

Technique Vital

If you expect to maintain the commercial gas cooking load now on your lines, you must know not only your competitor's product but also his sales technique. It is not the competitive product itself that could ever worry us, but the technique by which it is presented to the customer.

One particular customer states that he must have been put under a hypnotic spell, for after many hours of examining the evidence, he realized that the cool kitchen that would reduce his air conditioning bill by half and the tons of soap that would be saved each year by this greaseless cooking equipment, were all a myth. Enthusiastic presentation had sold him and he had placed his order without considering speed, operating, maintenance or installation costs.

You know the story. We have replaced numerous pieces of this equipment with modern gas equipment and saved our customers

Presented at Pennsylvania Gas Association Meeting, May 22.

Banner Year Forecast for Industrial And Commercial Section Committees

Karl Emmerling

A BANNER year of accomplishment is in prospect for the various committees of the Industrial and Commercial Gas Section of the American Gas Association, Karl Emmerling, chairman, according to program reports made to the section Managing Committee at its meeting June 3-4 at the Chateau Frontenac, Quebec.

The report on industrial and commercial national advertising by J. P. Leinroth, chairman of the section's Advertising Committee, showed that the 1948 program would be substantially the same in over-all coverage as the current one. Frank M. Foster, reporting for the Food Service Equipment Committee and the several subcommittees, indicated that the objectives set up at the beginning of the year will be fulfilled, or in the case of major items, will have progressed to such a point that succeeding committees will carry them to completion. The Managing Committee was informed that the Commercial Cooking Manual will be ready for the printer as soon as necessary art work is completed. The same success was reported by the Committee on Heat Treating and Finishing with Gas. Two information letters have already been mailed and eight more will be sent out during the balance of the year, according to the report of Charles C. Eeles, chairman. Considerable progress on the work of the Non-Ferrous Metals Committee was reported by W. Wirt Young. That committee is now working on melting problems and the sintering of powdered metals.

The managing group discussed the section's participation in national expositions the latter part of this year and in the Spring of 1948. They also decided to accept the invitation of the Union Gas Co. to hold the 1948 Sales Conference on Industrial and Commercial Gas in Windsor, Ontario, April 7-9, 1948.

many dollars in fuel and maintenance costs. You know the flexibility that gas equipment gives the operator, and you also know that it can be used any hour of the day or night without penalizing your customer with a demand charge, which costs from 40 to 55 percent of your customer's monthly bills.

You know most of the answers, but do your customers? Your management knows that modern commercial gas cooking equipment performs better than any competitive cooking equipment, and does it at less cost to your customers. But does the management know that you are not in a position to tell this story in many cases due to the lack of the necessary tools? These tools are the combination of "Manpower for Selling," "Money for Advertising and Promotional Campaigns" and "The Full Cooperation of all Divisions of your Company." If we had such tools, we could meet any competition in the commercial cooking field.

We have the best equipment and fuel to perform this work, so let's meet our competition by following these suggestions:

1. Present your management with a survey showing what percentage of cooking operations in your territory are being performed using fuels other than gas.
2. Give your management in detail, the workings of your competitor, including the number of men and cars. If your competitor has a display kitchen, does he give actual demonstrations in the field, service equipment, and have a dealer cooperation plan?
3. Present your management with the long range plan you would like to adopt. Include the required number of personnel, cars, money for advertising, demonstration equipment and a monthly publication to be mailed to all your commercial cooking customers.
4. If you do not have a dealer cooperation program, incorporate it in your plan and make it operate on a two-way basis. Make all your dealers a close part of your organization. Show them that you will work equally with them all, and you will find that they in turn will all work with you. Establish a plan to finance gas equipment for them. Assist your smaller dealers in modern kitchen planning. Service their complaints promptly and give assistance to their salesman by providing a manual of commercial cooking equipment. Help them to prepare proposals and close sales. Always remember that both parties must work for successful dealer cooperation.
5. Train your salesmen and pay them well. You cannot go out and hire men qualified in this field.

Armed with this program, you can take the offensive against competition and establish the position in this business to which you are entitled.

A commercial salesman of the hotel and restaurant division of a public utility must have the following qualifications to do a good selling job:

1. He must be honest, for every month he is turning over to the kitchen equipment houses thousands of dollars in sales, and there is always the possibility of one house trying to influence a utility salesman for this business.
2. He must be paid well, so that he can maintain a position in which business associates become a part of his life. Much of his time after working hours will be spent with them.
3. He must know not only his product, but also his competitor's.
4. He must know the language of the trade and the duties of each person in it.
5. He must know how to lay out a kitchen and the function of every piece of equipment in it.
6. He should have a good knowledge of cooking and why food preparation can be performed better on gas equipment than equipment using other fuels.
7. He should be a good mixer, as he calls directly on the customer and is always in close contact with salesmen from the kitchen equipment houses—men who call on the same customers and also sell competitive equipment.
8. He should never be regimented. He should be able to spend as much time with one customer or equipment salesman as he finds necessary.

Important Requisites

I believe these requisites are the most important qualifications a representative of the hotel and restaurant division should have to be in the field for a public utility. The American Gas Association is publishing a commercial cooking manual—the first piece of complete literature ever printed on this subject. We should see to it that every kitchen equipment salesman receives a copy. The manual covers every phase of the business and about half of the information deals with subjects other than gas which are vital to our business.

Emphasize to your men the importance of not under-estimating competitors. Emphasize the importance of arranging on the spot for the supervisor to see the customer if there is any question of a competitive fuel being used. This does not in any way mean that your salesman is admitting defeat, but gives him an opportunity to show his customer that we appreciate his business and that a department head is willing to spend his time to confirm facts already presented by the salesman and also to answer any questions that have not been presented.

Where a customer is in a quandary as to which fuel to use, a proposal should be presented which includes the following comparisons: equipment cost, installation cost, fuel cost, area of ovens, capacity of fryers, square feet of top cooking surfaces, claims and counter-claims, and a list of new installations and where replacement of competitive equipment has been made. This proposal if possible should be presented to your customer in the presence of an impartial engineer, preferably one familiar with electric rates and electric performances, and also members of the company you are competing with. I can assure you that if you present a

true proposal and your competitor does likewise, if your customer has an open mind you will come out with the order every time. Never misrepresent your product, for you have the best. Proof of its performance is in the fact that in every large chain restaurant, hospital, institution and hotel, you will find gas equipment preferred.

You may ask, "Why do we see some of the smaller operators using competitive equipment"? I will answer this question by saying that this is still a free country and that we can still purchase what we desire when we are spending our own money, but the hospitals, institutions, hotels and large chains have to account to others for the money they spend. It is their duty to investigate thoroughly before purchasing new equipment.

A utility is as sound as its service. Periodic inspection of commercial cooking equipment should be a "must" as poor service is the opening for competition to crawl through. Ernest Henderson, president of the Sheraton Hotels, confirmed this in his address at the New England Gas meeting in Boston last March:

"If the gas companies will demonstrate to those using gas equipment in hotels the large savings made possible by careful planning, careful adjustment and the substitution of new equipment where the need can be demonstrated, then the gas companies can help us bring our operating cost down to the level of the more efficient hotels."

Mr. Henderson continued: saying, "As the efficient utilization of this fuel is increased, more and more uses for gas will be found in hotel kitchens and the danger of competition from other sources of heating will be eliminated."

Mr. Henderson's statements should be capitalized on by every gas utility in the country. There is no doubt as to the necessity for closer cooperation between the sales and service departments of our companies. I see no reason why a customer, during normal times, should have to wait for weeks to get a part for a range, when he can procure parts for any automobile at a moment's notice. Nor can I appreciate the necessity for a customer, giving us $300 in revenue monthly, having to call for range adjustments, when periodic inspection eliminates such a condition.

Additional Costs

I have often wondered, if I were responsible for the service department of a gas utility which was giving free adjustment service, what answer I could give to management if they requested me to explain why customers were paying others to service their gas cooking equipment when, by calling us, they could have it serviced free. I was astounded not many months ago, when after presenting to the manager of a hotel a proposal for new equipment including an operating cost comparison with another fuel, he pointed out that I must add to the fuel cost $65 per month for service, which he was paying to others to service this equipment.

All costs necessary to keep equipment in operation must be charged to operating cost, and this manager was right in making me include this $65. When I asked him why he was paying this amount of money each month, he stated, "Did you ever call for service and get an answer as to when your service man would call? We serve over 2,000 meals a day and cannot wait a couple of days for service."

Management should never forget that a salesman can open new accounts, but once opened, it's the service rendered that keeps them on the books.

I believe we all recognize the large percentage of casualties in the restaurant business. The small Business Advisory Service of the Bank of America, in San Francisco, lists the following facts: One third of the new restaurants are said to fail, quit or sell out in a year, with 80 percent out of business by the end of the fifth year. All purveyors to the restaurants are familiar with these facts, but they are also familiar, with the fact that 20 percent are going to be successful, and this 20 percent will make or break a business.

Consider what would happen if a meat, vegetable, grocery wholesaler took the following position: Estimate what the monthly purchase would be, double this for ample protection, and demand that the new operator of a restaurant put up as a deposit, this amount as a guarantee. You have guessed right, we would never get any business. I do not advocate that we eliminate deposits, but I do advocate using discretion, inasmuch as we can discontinue our service after sufficient leniency has been extended.

My suggestion is that we have closer cooperation with our credit and collection departments, so that we can be advised of chronic delinquents. It has been my experience that a representative of the hotel and restaurant division of a utility can do more good and less harm with delinquent accounts than a bill collector appearing at noon with a shut-off key in his hand. I do not blame the credit manager of a utility, but I believe that if the facts were presented showing the importance of this commercial load a more liberal policy would be established.

I know of one commercial establishment which had paid a monthly average of $300 for 20 years. Due to a death in the family, new operators took over, including one em-

A.G.A. To Sponsor Exposition Exhibits

Committee on arrangements for the 1947 hotel exposition. Seated, left to right: K. F. Muldoon, J. T. Heilig, J. C. Pitman, W. J. Marshall, G. A. Bowman, L. E. Clancy. Standing, A. G. Henry, O. E. Werner, M. P. Duke, F. H. Groen, W. D. Crouch, H. C. Erchar, F. C. Neuls, M. A. Combs, J. J. Bourke, A. G. A., and D. J. Brogan

THE American Gas Association will sponsor combined gas exhibits in two national expositions in the Fall of 1947, according to a recent announcement by Karl Emmerling, chairman, Industrial and Commercial Gas Section.

The first will be a combined industrial gas exhibit at the National Metal Congress and Exposition in the National Amphitheatre, Chicago, October 18-24, where the latest in industrial gas equipment will be on display in the largest single exhibit of the Exposition. Centrally located opposite a main entrance, the exhibit will be a focal point that cannot be missed by the visitors to the Metal Show. The "Blue Flame" motif will predominate. An over-all tie-in has been designed to promote gas fuel and reaffirm that "The Trend is to Gas for all Industrial Heating."

November 10-14, A. G. A. will sponsor a Combined Commercial Gas Cooking Exhibit at the National Hotel Exposition, Grand Central Palace, New York. Again, the largest single exhibit will occupy both sides of a main aisle. For more than 100 feet visitors will walk between the largest groups of commercial cooking appliances ever assembled in one exhibit. Some 30 exhibitors will show their latest designs in commercial cooking equipment and gas-fired kitchen accessories.

These two expositions will afford an opportunity for gas men, manufacturers, and industrial and commercial gas consumers to meet and discuss their respective problems.

The section's traditional Industrial Gas breakfast with the editors of the metals trade magazines will be held Wednesday morning, October 22, at the Hotel Stevens. All gas men attending the metal show are invited to be present.

ployee who was president of the new owner corporation, and also a director of the National Restaurant Association. The credit department demanded a deposit of $300 and the sales manager had to accept the responsibility for this account or the gas was to be shut off. Could you visualize any other purveyor asking such a guarantee?

If the sales department is to be the liaison between the customers and the utility, then it should be considered and consulted in matters pertaining to our relations with customers. We all agree that a successful company is one in which all divisions work together as a unit.

I have tried to make clear that we in the sales department do not fear the service or equipment offered by our competitors. We do ask that management give the sales department the necessary tools with which to serve and tell the public that commercial gas cooking equipment is the most economical, dependable and the best all-round equipment for the preparation of food.

Food Service Equipment Groups Active

Food Service Equipment Committee. L. to r.: J. A. Rockefeller, Newark; F. M. Foster, Los Angeles, chairman; L. J. Fretwell, Tulsa; E. V. Fineran, Washington, D. C. Standing: H. C. Erhard, Baltimore; W. D. Crouch, Youngwood, Pa.; D. J. Brogan, New York; J. J. Bourke, M. A. Combs, A. G. A.; R. S. Juergens, J. C. Dorsey, Cleveland; W. J. Anderson, Boston

Subcommittee on Appliance Improvement. Left to right: John J. Bourke, A. G. A.; Ray S. Juergens, Cleveland; L. J. Fretwell, Tulsa, chairman, and J. C. Dorsey, Cleveland

Joint F.S.E.I.–A.G.A.–G.A.M.A. Committee in session at Hotel Stevens, Chicago

THE mid-year meeting of the American Gas Association Food Service Equipment Committee, Frank M. Foster, chairman, was held during the recent National Restaurant Exposition in Chicago.

E. V. Fineran, chairman, Subcommittee on Sales Promotion, reporting on activities and recommendations for sales aids, suggested that the Food Service Equipment Committee give serious consideration to the production of a motion picture by the Industrial and Commercial Gas Section.

Direct mailing pieces which were shown to the committee received favorable comment. If enough companies signified their willingness to make use of this medium, it was suggested that the A. G. A. underwrite the cost.

The Subcommittee on Appliance Improvement, L. J. Fretwell, chairman, recommended that suggestions for the improvement of appliances by manufacturers should be of such a nature that they can be made as new models are designed and not require extensive retooling for the production of present models. These improvement recommendations should follow the normal trend in equipment design and become a part of manufacturers' future plans. The committee recommended for solid top ranges broader use of present alloy tops which all manufacturers can now supply. Unanimous opinion of the subcommittee was that the most dire need was for thermostatic pilots as standard or optional equipment on some of the commercial gas equipment, such as roasting and baking ovens. The belief was expressed that A. G. A. should work directly with the manufacturer in developing a suitable type of pilot for this purpose and that the committee's approach to the improvement problem should entail coordinated effort with manufacturers.

Walter S. Anderson, reporting for Roy E. Wright, chairman of the Subcommittee on Sales Training, stated that the work of this subcommittee had been limited to preparing material for the Commercial Gas School and the Commercial Manual. The Manual is now taking shape and is almost ready for the printer.

The report of Charles F. Sevenoaks, chairman of the Subcommittee on Restaurant Sanitation, stated that in view of the national agitation for restaurant sanitation it was up to gas companies to promote this aspect in their advertising and publicity. It was agreed that water for washing should be 120° to 140° F. and for sterilization, 170° to 180° F.

and that most local governments had these temperature requirements in their codes. Here is a high potential gas load for both water heating and booster heating that should be promoted to the fullest extent. It was further suggested that the Food Service Equipment Industry, Inc. should be informed of A. G. A. activities and strong efforts made to secure the support of the F. S. E. I. for equipment to supply 180° water for dish washing machines.

Joint Committee Seeks Closer Cooperation

AN important meeting of the Food Service Equipment Industry, Inc.—American Gas Association—Gas Appliance Manufacturers Association Joint Committee was held in the Hotel Stevens, Chicago, recently with a fourfold purpose described by Chairman Frank M. Foster as follows:

To afford a means for the discussion of mutual problems and interchange of ideas; to encourage the development and promotion of ideas that will benefit the industries represented; to develop closer relationship and better understanding between the three groups, and to recommend to each of the three associations procedures that will improve overall conditions.

Present were: W. H. Rudolph, Savory Equipment Inc.; D. J. Brogan, The G. S. Blodgett Co. Inc.; W. D. Crouch, Robertshaw Thermostat Co.; R. F. Patrick, The G. S. Brodgett Co. Inc.; M. A. Combs, A. G. A.; Frank M. Foster, Joint Committee chairman, Southern California Gas Co.; I. S. Anoff, Food Service Equipment Industry, Inc.; S. R. Sperans, Nathan Straus, Duparquet, Inc.; L. E. Clancy, Detroit-Michigan Stove Co.; E. V. Fineran, Washington Gas Light Co.; T. J. Gallagher, Peoples Gas Light and Coke Co.; J. J. Bourke, A. G. A.

Convention Plans

J. C. Dorsey

JOHN C. DORSEY, The East Ohio Gas Co., Cleveland, chairman of the Industrial and Commercial Gas Section's convention program committee, has announced plans for the section's part in Cleveland, October 6-8.

Plans provide for an Industrial and Commercial Gas luncheon on Tuesday, October 7, with an outstanding speaker, followed by a general session of interest to both executives and other gas men attending the convention.

Food Service Equipment Convention

R. D. MacMahon, Los Angeles; David J. Brogan, New York; F. M. Foster, Los Angeles, chairman, A. G. A. Food Service Equipment Committee, and L. E. Clancy, Detroit

APPROXIMATELY 265 members and guests attended the annual convention of the Food Service Equipment Industry, Inc. at Coronado, Calif., June 10-13, with three of the seven program speakers representing the gas industry.

During a luncheon meeting of the board of directors on June 12 the following officers were elected: S. R. Sperans, president; M. R. Thompson, vice-president; J. V. Hirlehey, executive secretary, and S. F. Okinow, treasurer. Earlier the members elected five new directors.

At the final session on June 13 three gas industry speakers highlighted the program. John J. Bourke, director, Commercial Gas Cooking Promotion, American Gas Association, explained "The Dealer's Stake in the Future of Gas." Frank M. Foster, commercial sales manager, Southern California Gas Co., Los Angeles, discussed "Mutual Benefit Through Association Activities," and R. D. MacMahon, chairman, Commercial Cooking Council, Pacific Coast Gas Association, spoke on "Hot Water Regulations and Installation Techniques."

Open the Door to Restaurant Sanitation

A RECENT exposition staged by an electric utility and county health authorities on Methods of Fulfilling the Requirements of Restaurant Sanitary Ordinances contains the germ of an idea that might well be adopted by gas companies to help promote publicly the need for restaurant sanitation and education for restaurant operators on the needs for hot water.

The exposition was set up in the company showroom and had the additional backing of local hotel and restaurant supply houses. It was supplemented by a series of daily programs in the company auditorium for operators of all types of restaurants, cafeterias, clubs and taverns. These daily meetings were slanted to cover particular problems in the four varied classes of commercial food service. A 20-minute film on proper dishwashing and glass washing methods was also shown.

Each community has its sanitary code for public eating places, and it is the enforcement of these codes that concerns the gas company on the hot water phase of sanitation. The ultimate in hot water supply is two services—one at 120 to 140° F. for general purpose water and dishwashing and the other at 170 to 180° F. for sterilization rinse of tableware after washing. Gas automatic water heaters and gas automatic booster heaters are the best and most economical for this purpose. Here is a high potential gas load that should be promoted to the fullest extent. One of the best means of securing this load is through an educational campaign in which all elements concerned can cooperate. By educating the operator and the equipment dealer on the advantages to be gained, together with such cooperation as can be secured from health departments.

Gas companies can institute such a program and readily secure the cooperation of dealers and operators. Programs do not have to be elaborate, but may consist of a few small meetings for interested parties. An excellent film on dishwashing put out by the Economic Laboratories, Inc., St. Paul, Minn., ties in very well with the service a gas company has to offer.

Over 90 percent of the 65 million meals served daily outside of the home are cooked by gas, therefore it is only logical that other kitchen services be gas-fired. Hot water is a *must* for cleanliness, and the modern gas equipment designed to supply the required temperatures of hot water are the best and most economical for this service.

Technical Section

C. S. GOLDSMITH, Chairman | A. C. CHERRY, Vice-Chairman | A. GORDON KING, Secretary

Production and Chemical Conference

Headliners: S. Green, chairman, Gas Production Committee; Hudson W. Reed, Philadelphia; H. Carl Wolf, New York, and W. R. Fraser, chairman, Chemical Committee

THE Joint Production and Chemical Conference sponsored by the Technical Section of the American Gas Association at the Hotel New Yorker, N. Y., June 2-4, once again demonstrated the capacity of gas operating men to meet the challenge of changing conditions. More than 600 gas engineers and chemists from this country, Canada and England participated in the deliberations which ranged from new applications of time-tested methods to the fringe territory of nuclear energy utilization.

Within the framework of two all-day general sessions, one morning general session and an afternoon of round-table luncheon conferences, there was ample evidence of the industry's extraordinary effort to break the bounds of conventional gas production practice to meet the unprecedented demands for gas service. Special attention was devoted to reports on the A. G. A. gas production research program, high B.t.u. gas processes and the interchangeability of gases.

S. Green, The Brooklyn Union Gas Co., chairman of the A. G. A. Gas Production Committee, and W. R. Fraser, Michigan Consolidated Gas Co., chairman of the A. G. A. Chemical Committee, alternated as presiding officer of the conference.

In his opening remarks, Mr. Green pointed out that plant operators were taxed this past winter as probably never before in the industry's history. "The tremendous growth in demand for our product, coming suddenly on the removal of war controls, coupled with the delay in obtaining production equipment, created a major problem for most companies," he said. This challenge is being met, Mr. Green stated, by a well-rounded research program studying the fundamentals and techniques of gas production processes.

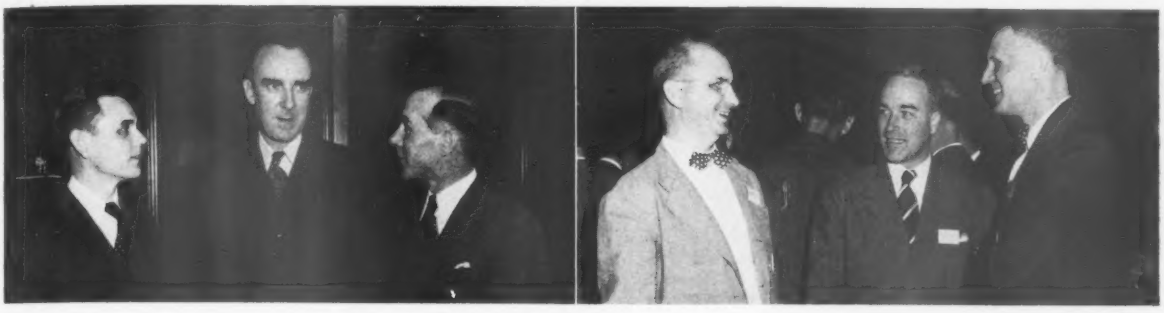
Problems of the production men were further defined by the next speaker, H. Carl Wolf, A. G. A. managing director, who reduced them to the ABC's of atomic heat, B.t.u. and capacity. Atomic heat is both a challenge and an opportunity for the gas industry, Mr. Wolf declared. The B.t.u. standards of gas are receiving increasing attention, he said, adding that they will be determined by economics and the best utilization of natural resources. As for capacity, "when the public demands gas, we must meet those demands." He advocated the adoption of realistic, far-seeing programs to solve these problems.

"Sendout Growth—A Threat and a Promise" was the title of a forthright and informative address by Clifford E. Paige, president, The Brooklyn Union Gas Co., which was a conference highlight (the text of Mr. Paige's talk appears in this issue beginning on page 315). Mr. Paige outlined the experience of his company in meeting an output which in one year had reached the figures "which our most careful projections had indicated might be reached in five years after the war."

Indicative of the strain on company facilities, mostly as a result of the skyrocketing house heating demand, Mr. Paige pointed out that "early in 1944 we thought that manufacturing capacity might need $5 million for new plant. In 1945 it looked as if $10 million would be hardly enough. By the end

Between sessions: (l. to r.) R. J. Chambers, Buffalo; G. G. Dormer, Binghamton; M. Frank Knoy, Chicago; Edwin L. Hall, A. G. A.; C. C. Russell, Kearny; F. J. Pfluke, Rochester; E. W. Andrews, E. A. Manlove, Chicago; Dr. A. W. Gauger, State College; E. L. Sweeney, Everett

Dr. J. G. King, London; F. B. Cadmus, New York; A. C. Sedlachek, K. E. Baird, Philadelphia; S. A. Petrino, C. A. Gallagher, Brooklyn



Waiting for next session to start at the Hotel New Yorker are (left to right), A. R. Bayer, Brooklyn; R. B. Paquette, Chicago; J. F. Anthes, Brooklyn; H. B. Noyes, Washington; Ronald A. Malony, Bridgeport and W. K. Beard, Philadelphia

of 1946—and due to this entirely new situation—our figures had risen to $24 million."

With a new labor contract adding $1.7 million annually to the payroll, Brooklyn Union has applied for a rate increase amounting to $1.9 million, Mr. Paige said. He urged the gas industry to study its rate allocations and to establish more clearly costs for different classes of service.

The A. G. A. research program received high praise from Mr. Paige who called it "our best assurance for the future." He concluded his provocative remarks with the admonition "don't ever sell the gas business short."

Future possibilities in methods of manufacturing gas were presented in a comprehensive report by Dr. A. R. Powell, associate director of research, Koppers Co., Pittsburgh, which was based largely on his testimony before the Federal Power Commission during the natural gas industry investigation.

Some of his conclusions are:

1. Future raw materials for the manufacture of gas in the northeastern quarter of the United States will continue to be chiefly bituminous coal and heavy fuel oil. Relatively small quantities of liquefied petroleum gases will be used for extreme peaks.

2. High temperature carbonization of bituminous coal will continue to be carried out predominantly in large by-product coke ovens with future technical developments to decrease gas costs along the following lines: new by-products, and the upgrading and discovery of new uses for present products; increasing capacity of present equipment; increasing thermal efficiency; and cheaper plant construction.

3. Location of high temperature carbonization plants near the point of gas consumption is more economical than their placement at the coal mine.

4. Low-temperature carbonization of coal is of no future interest in the manufacture of distributed gas.

5. The carburetted water gas process, using predominantly coke and heavy fuel oil as raw materials, will remain as a major method of manufacturing gas for many years to come.

6. None of the processes for complete gasification of coal recently developed in Germany and elsewhere are suitable in their present state of development for the manufacture of city gas in this country. Additional research and the expenditure of considerable sums of money will be required to completely evaluate this principle for possible manufacture of city gas.

7. Manufacture of oil gas exclusively from oil shows little promise of future application in the Northeastern United States because of high investment cost, low operating credits, and low thermal efficiency.

8. Refinery oil-gas, LP-gases and natural gas, will to a limited extent be converted by reforming or be mixed to serve as a substitute for fuel oil for enrichment purposes, or to increase the capacity of water gas plants during peak load periods.

9. Manufacture of gas in combination with the manufacture of some other product, other than the high-temperature carbonization of coal, does not appear as of much promise for future cheaper production of distributed gas.

Gas research in England is being conducted similarly to the A. G. A. gas production research program, Dr. J. G. King, director, The Gas Research Board, London, told the conference in a brief review of his organization's program. Dr. King emphasized that since present gas production processes are limited, research should be almost entirely

C. W. Wilson, Baltimore; Irving Resnick, Cleveland; Dr. Clark Goodman, Cambridge; Benjamin Miller, New York; Dr. J. R. Dunning, New York, and M. Berman, Brooklyn

Left: Gus Chabre, Los Angeles and A. D. Harrison, Brooklyn. (Center) Luncheon Conference on Carbonization and Coke—L. D. Schmidt, Morgantown; F. E. Ceccarelli, New York; W. C. Wardner, chairman, New Haven; H. K. Merker, Brooklyn, and C. C. Russell, Kearny. (Right) R. E. Kruger, Rochester; Dr. E. W. Guernsey, Baltimore, and H. D. Lehman, Philadelphia

directed toward developing new alternative methods with which to raise efficiency and lower costs. England does not have natural gas and has very little oil for enriching purposes, so the program is confined to processes of completely gasifying coal.

The Monday morning general session closed with a report on the A. G. A. gas production research program by F. J. Pfluke, Rochester Gas & Electric Corp., chairman, Technical Advisory Committee. Mr. Pfluke outlined the various projects underway at different institutions and spoke of the relation of these projects with those of such organizations as the U. S. Bureau of Mines, Bituminous Coal Research, Consolidated Coal Co., Hydrocarbon Research Corp., and others.

Louis Shnidman, Rochester Gas & Electric Corp., chairman, Subcommittee on Gaseous Fuels, announced that the 400-page technical handbook, "Gaseous Fuels," is in the hands of the printer and would be available for distribution in the near future.

A major part of the Monday afternoon session was devoted to symposiums on tar and the interchangeability of gases. Opening the first forum, J. F. Anthes, The Brooklyn Union Gas Co., chairman, Technical Subcommittee on Mixed Gas Research reported on Gas Research Committee Project T1-1 being conducted at the A. G. A. Testing Laboratories. This mixed gas research project has completed a desk study and a field survey, and is now on the final phase of experimental work with appliances and test burners. The latter calls for work with nine adjustment gases and 67 supplemental gases as well as with various combinations of the adjustment and supplemental gases.

An interesting feature of the investigation, Mr. Anthes pointed out, is a miniature blue gas generator and carburettor used for the production of carburetted water gases, blue gases, oil gases, and blow-run gases which was designed and constructed by the Laboratories for use in the project.

Interchangeability of gases under 800 B.t.u. was discussed in a paper by L. Shnidman and J. S. Yeaw, Rochester Gas and Electric Corp., presented by Mr. Yeaw. Experimental work Mr. Yeaw stated, resulted in the defining of limiting or boundary line mixtures of 540 B.t.u. per cubic foot composed of coke oven gas, producer gas, blue gas and natural gas. Increases in plant capacity and flexibility were also obtained during the work on interchangeability.

Another group studied was classified as emergency mixtures and made up with natural gas and air, stack gas, producer gas, low B.t.u. blue-blow run gas, etc.

Emergency Mixtures

"The experimental results showed," Mr. Yeaw declared, "that none of these mixtures could be considered satisfactorily interchangeable with the former distribution product, but that they might be employed in emergency situations with all that that implies."

Variations in sendout gas composition during the past winter of 53 companies together with an evaluation of results achieved and plans for future expansion were presented in a valuable paper by R. B. Paquette, The Peoples Gas Light and Coke Co., Chicago. The data which was compiled by questionnaire is divided into four groups: natural gas and blended gas, consisting of 14 companies; coal gas, consisting of 20 companies; water gas, consisting of 15 companies; and oil and refinery gas, consisting of four companies. Of this number, 38 companies have LP-gas plants in use or under construction.

Progress on another important Gas Production Committee Research project, CPR-1C, on the catalytic reforming of hydrocarbons, was reported in a paper by Pierre C. Lurie, Charles H. Riesz and Howard R. Batchelder, presented by Mr. Batchelder of The Institute of Gas Technology. The authors described a small pilot plant set up at Chester, Pa., to test various catalysts and hydrocarbons such as refinery oil gas, propane from refineries, butane and heavier hydrocarbons. Work with various steam and air-gas mixtures was outlined as well as plans for future activities.

The symposium on tar opened with a discussion of mechanical dehydration of coke oven tar emulsion by E. W. Young, assistant superintendent, Bethlehem Steel Coke Oven Plant. He described in detail the apparatus used in the Sharples Super-Centrifuge Process of Coke oven tar dehydration and quoted the following results at a cost of about $.001 per gallon:

Crude tar as received: moisture 10 to 20 percent; ammonium chloride, 0.20 grams/100 gram tar; solids, carbon, ash, etc., variable;

Tar after centrifuging: moisture, one to one and one-half percent; ammonium chloride, .018 grams/100 grams; solids, practically free of solids that will precipitate in storage tanks.

Further experience with mechanical dehydration of water gas tar emulsions with special reference to the Sharples process operated at the Citizens Works of The Brooklyn Union Gas Co. was presented in a timely report by A. G. Hall and A. R. Bayer of the Brooklyn utility.

Compared with thermal dehydration, steam

Discussing highlights of conference (Left) G. V. McGurl, Kearny, and A. E. Sands, Morgantown. (Center) Water Gas Subcommittee Luncheon Conference—H. C. Jones, Boston; S. Green, Brooklyn; J. V. Postles, chairman, Philadelphia; Oliver H. Smith, New York, and Marshall Hyde, Port Huron. (Right) T. L. Robey, Washington; Dr. W. J. Huff, College Park, and R. F. Tenney, Lynbrook

Left to right: J. B. Klumpp, Philadelphia; L. A. Friederick, Tampa; Alan H. Harris, Jr., Winnipeg; W. H. Parish, New York; W. E. Steinwedell, Cleveland; E. E. Richardson, Cambridge; Walter C. Slade, Boston; Kenneth M. Stookey, Cleveland; H. A. Lockhart, Haverhill; Everett J. Wilson, Boston; Joseph M. Gencarelli, Augusta; R. Van Vliet, New York, and Oliver H. Smith, New York

requirements for the mechanical method are considerably lower, Messrs. Hall and Bayer indicated, and general maintenance and supervision are low. A centrifugal unit has operated continuously for 30 days with good results, although the authors advised a policy of cleaning and inspection after two weeks' operation.

A method of demulsification of water gas tar emulsions which completely demulsifies and cuts time of treatment from 36 to 14 hours was described by S. A. Petrino, Kings County Lighting Co., Brooklyn. The process involves the use of a catalyst in conjunction with the customary heat treatment.

The use of catalytic treatment, according to Mr. Petrino, has made possible approximate doubling of tar output without necessity of further installation of tar-treating facilities. The tar emulsion difficulties have been eliminated and a reduction of approximately 50 percent in the cost of labor, steam and chemicals has been effected, the speaker stated. Furthermore, clarity and quality of the separated water are such that no further treatment of it is required before being discharged as plant effluent.

Water-Gas Tar

The first annual report on Gas Production Research Committee Project PSC-1, Studies on Water-Gas Tar, at The Pennsylvania State College, prepared by Dr. A. W. Gauger, C. R. Kinney and R. L. Struck, all of the college faculty, was presented by Dr. Gauger. Main objective of the program is to determine the identity of the individual components of these tars so that they may be better exploited by the industry.

One of the most common methods of dehydrating water gas tars involves removal of water by distillation, Dr. Gauger said. "Such heat treatments induce more or less polymerization of the unsaturates and decomposition of asphaltenes which raise the viscosity of the tar," he added.

He reported that an examination of the data from a vacuum distillation of the pentane extract with the indexes of refraction and other data indicated the presence of the following hydrocarbons: xylenes, styrene, trimethylbenzenes, methylethylbenzenes, methyl styrenes, dicyclopentadiene, indene, tetramethylbenzenes, dimethyl styrenes, naphthalene, methylnaphthalenes, azulenes, dimethylnaphthalenes, phenanthrene, anthracene, and chrysene.

Probably the hot storage of water gas tars induces polymerization of many of the unsaturated molecules, Dr. Gauger stated, although work in this direction is not complete. "On the other hand storage at room temperature appears to have little effect," he added.

The study of dehydration tar emulsions by the use of pentane has shown that while the emulsion may be broken, not all of the resin-forming molecules are extracted, the Pennsylvania State research brought out. The use of isopropyl alcohol, Dr. Gauger continued, is another method of dehydrating tars being investigated which would have the advantage of not inducing polymerization of the tar-unsaturates. "Eventually," he concluded, "we hope to find the answers to these as well as many other problems connected with water-gas tars."

Col. Hudson W. Reed, president, The Philadelphia Gas Works Co., and A. G. A. first vice-president, opened the Tuesday morning general session with a brief address in which he praised the work of the conference committees and enjoined the delegates to allow more time for personal contacts at future meetings.

Closer contact and better coordination between the sales and engineering departments of utility companies are needed, Col. Reed said, pointing out that engineers could teach salesmen to reject uneconomic business and concentrate upon sound markets."

1948 Conferences Set

● **Dates for two spring conferences of the Technical Section of the American Gas Association have been announced by C. S. Goldsmith, chairman of the Section. The 1948 Distribution and Motor Vehicle Conference will be held April 19-21 at the William Penn Hotel, Pittsburgh. The Joint Production and Chemical Conference will take place May 24-26 at the Berkeley-Carteret Hotel, Asbury Park, N. J.**

Great interest was shown in the address by R. J. Chambers, Iroquois Gas Corp., Buffalo, on the "Twin Generator Oil Gas Process for Production of High B.t.u. Gas." This set was installed by the company after preliminary investigation indicated that it would "increase production of high B.t.u. gas and eliminate the unpleasant job of fire cleaning."

Mr. Chambers reported that tests showed that "the Twin Generator Oil Gas Process eliminates the manpower required for handling generator fuel, cleaning fires, removing clinker and ashes, and can be operated by

Left: S. C. McLaughlin, Claremont; G. F. Knight, Toronto; W. H. Benson, Worcester, and J. V. Postles, Philadelphia. (Center) Luncheon Conference on High B.t.u. Gas—M. J. Pfeiffer, Cincinnati; George T. Bentley, Detroit; G. J. McKinnon, chairman, Detroit; J. P. Stephens, Cincinnati; L. J. Eck, Minneapolis; C. L. Hulswit, Spring Valley. Dr. William F. O'Connor, New York, and Dr. W. J. Huff, College Park

a minimum number of men. The operation of the set," he said, "is relatively simple, clean and appealing to workmen. One visitor remarked, 'A man could work this job wearing a tuxedo'.

"The gas maker has 'fingertip' control of the temperatures in the set and can thereby regulate the quality of the gas produced.

"The production capacity of the original High B.t.u. gas set using coke as a generator fuel was increased 100 percent by conversion to the Twin Generator Process, and a regular and more dependable source of supply attained.

"The set is now equivalent," Mr. Chambers added, "to a 6,000 M.c.f. per day natural gas well in our plant."

The establishment of new high makes at the Astoria Long Island Plant of the Consolidated Edison System, the company's largest capacity plant, was described in detail by George L. Bixby, superintendent's assistant at the plant. He outlined the following steps taken to assure a daily output of 95 million cubic feet during winter months; keeping a maximum number of generator sets available for operation; hiring sufficient operating personnel to keep 22 sets in continuous operation; segregating a stock of good quality enriching oil and coke as a reserve for peak loads; altering Kennedy Automatics in the "D" House to afford a longer blow run period in the cycle, and reducing the pressure of the gas at the outlet of the exhausters, plus the installation of electrostatic tar precipitators.

Additional Plant

In addition, a liquefied petroleum-air plant was installed designed to provide an extra 18 million cubic feet per day over a 3.5 day period.

Another informative paper presented at the morning session was delivered by T. A. Corby, Central Hudson Gas & Electric Corp., Poughkeepsie, on "Experiences with Silicon Carbide Linings in Water Gas Generators."

He concluded that the gas industry is generally adopting silicon carbide for generator linings and even in some cases for lining cross-over connections and other parts of the water gas set.

A pertinent and ever timely subject, "Location of Internal Defects of Plant Equipment," was discussed by Benson Carlin, project engineer, Sperry Products, Inc., Hoboken, N. J., who focussed attention on supersonic testing. "Equipment may be tested in this manner without damage to any part and very often without any dis-assembly," Mr. Carlin declared. "When materials are tested supersonically the depth of penetration may be as great as 25 feet and there is essentially no lower limit to the size of the flaws which may be found."

The speaker gave as illustrations of types of tests performed by the Supersonic Reflectoscope: testing shafts, testing prior to repair, testing castings and fatigue testing.

The remainder of the second day was devoted to four off-the-record round-table luncheon conferences which evoked some of the most lively and pertinent discussions of the three-day meeting. These conferences were divided as follows:

Carbonization and Coke—Walter C. Wardner, Connecticut Coke Co., New Haven, chairman; H. K. Merker, The Brooklyn Union Gas Co., alternate chairman.

Chemistry in the Gas Industry—B. Miller, Ozone Park, N. Y., chairman.

High B.t.u. Gas—G. J. McKinnon, Michigan Consolidated Gas Co., Detroit, chairman; J. P. Stephens, Cincinnati Gas and Electric Co., alternate chairman.

Water Gas Operation—John V. G. Postles, The Philadelphia Gas Works Co., chairman; Oliver H. Smith, Consolidated Edison Co. of New York, Inc., alternate chairman.

While all of these round-table meetings tackled problems of major concern to operating men, it is noteworthy that the "High B.t.u. Gas" conference attracted the largest attendance in the history of this event. It is also significant that atomic energy and its possible utilization by the gas industry provoked one of the most animated discussions at the "Chemistry in the Gas Industry" session.

A clearcut exposition of the possibilities and problems of nuclear energy was presented by Dr. John R. Dunning, Columbia University, and Dr. Clark Goodman, Massachusetts Institute of Technology. Other formal reports at the chemical meeting included: "Storage of Natural Gas in Propane at Low Temperatures," Irving Resnick, Stacey-Dresser Engineering Co.; "Oxygen Determination in Gases," Dr. C. W. Wilson, Consolidated Gas Electric Light and Power Co. of Baltimore; "Pilot Outages," M. Berman, The Brooklyn Union Gas Co.; and "Setting Residential Appliances for Laboratory Tests of Supplementary and Substitute Gases," T. L. Robey, Washington Gas Light Company.

First program feature on the Wednesday morning general session was a comprehensive analysis of selection of coals for coke manufacture, by C. C. Russell, Koppers Co., Inc., Kearny, N. J., who noted that 105 million tons of coal were carbonized in 1944, the largest amount ever coked in the United States in any one year.

Included in Mr. Russell's paper were outlines of laboratory tests, box coking tests, expansion tests, movable-wall oven, oven coking tests, calculation from analyses and plasticity tests. One of the outstanding developments in coal technology in the past decade, he said, has been the standardization of a method for classification of coals.

The 87 million tons of coal carbonized in by-product ovens in 1945 produced 904,476,118 Mcf of coke oven gas, Mr. Russell declared. He also outlined by states the sources of the coal used.

Channing W. Wilson, Consolidated Gas Electric Light & Power Co., Baltimore, followed with an introduction of two papers relating to A. G. A. Gas Production Research Committee projects on water-gas and similar reactions. He reviewed the history of these projects and the reasons for their importance to the gas industry.

The committee's studies of water-gas fuel bed in a small-scale generator were described by Dr. John F. Foster, Battelle Memorial Institute, Columbus, Ohio, who presented a report on which he had collaborated with Donald A. Vorum. Primary objective of the present phase of the investigation, Dr. Foster remarked, "is to characterize the fuel bed of the generator, as completely as possible under controlled conditions, with respect to temperatures and gas compositions occurring at fixed times, locations and rates of material flow."

Study of the present cycle will be continued as outlined, he said, and once techniques are developed the study of other cycles can proceed in rapid succession.

A progress report on the study of the reactions between oxygen, steam and carbon, by Sidney Katz and Joseph D. Parent, both of The Institute of Gas Technology, Chicago, was delivered by Dr. Parent. The report outlined the series of equilibrium calculations evolved for the oxygen-steam-carbon reaction and was implemented by slides illustrating the data collected.

Conserve Resources

Dr. William F. O'Connor, professor of safety engineering, New York University, presented a straightforward paper on "Conservation of Production Resources," sponsored by the Accident Prevention Committee, H. T. Jayne, chairman. Both management and labor have shown great indifference, Dr. O'Connor said, to the very factors which make production possible. These are: personnel, property and product.

"We must protect against all factors that may result in the loss of these resources as well as those that may interfere with their maxi-

Index to Chemical and Related Subjects

THE Chemical Committee of the Technical Section, American Gas Association, has provided a new Index to Chemical and Related Subjects. Compiled by Luis Hilt, E. Holley Poe & Associates, the new publication is available at one dollar for A. G. A. members and $1.50 for non-members.

Dr. Channing W. Wilson, immediate past-chairman of the Chemical Committee, stresses in the foreword that the volume is presented to the gas industry as an addition to the index assembled by R. H. Oppermann of the Committee in 1936 and covers in one volume work and publications of the past decade not ordinarily indexed or abstracted in scientific literature.

Dr. Wilson further pointed out that the new index had been undertaken after Mr. Oppermann's previous index had proved its use to gas men in locating articles and papers on chemical subjects which had been presented at the various Association meetings.

"In addition to the sources covered in the first index," he stated, "several others are included in the present volume. Indeed, this book includes half again as many references, although the period embraced is only one-third as great. This reflects the expanded technical activity of the industry as well as the addition of reference sources."

mum and efficient use, such as accidents, fires, explosions, wastage and toxic properties."

Examining the need for greater emphasis on chemical process safety, Dr. O'Connor recommended the following program: get students in the colleges to recognize the importance of process safety; increase cooperation between production men and designing engineers to the end of improved plant layout; reduce risk by subdividing raw material, intermediate and product storage which can be grouped together for ease of protection.

"Too much emphasis cannot be placed on safe operating procedures and proper safety training in job instruction. The same applies to standard maintenance, repair and construction procedures. Proper development and enforcement of these standards will put an end to wildcat operation and makeshift repairs—cause in the past of loss of many of our production resources."

In the next program feature A. B. Lauderbaugh, The Manufacturers Light & Heat Co., Pittsburgh, described experiences in handling and unloading of LP products. One of the most critical problems facing the LP-gas business, he said, is that of materials—"how to help your own situation and at the same time your brothers in the industry."

Using slides, Mr. Lauderbaugh showed LP tank farms, tank cars and the intricate mechanisms required for car-to-holder unloading. He pointed out required safety features on tank cars, safest unloading practices and means of removing the last traces of LP-gas from railroad tank cars.

Reverse Flow Set

The afternoon session was opened by W. R. Fraser, who turned the proceedings over to J. G. Sweeney, The Brooklyn Union Gas Co., vice-chairman, Chemical Committee. C. A. Gallagher, Long Island Lighting Co., Garden City, N. Y., initiated the session with a talk on "Operating Experience With Reverse Flow Gas Set, Utilizing an English-Type Mechanical Grate at Bay Shore." The grate is the first of its kind used in this country in a carburetted water gas machine.

Dr. A. W. Gauger, chairman of the American Society for Testing Materials' Committee D3 on Gaseous Fuels, presented a brief summary of the activities of that group.

Contributions of timely importance were included in the symposium on oxygen which opened with a report prepared by Dr. Henry J. Rushton, Illinois Institute of Technology, Chicago, and Dr. Charles R. Downs, consulting chemical engineer, New York, on oxygen use and production. Dr. Rushton read the report reevaluating recent developments in oxygen manufacture. Oxygen can be manufactured most suitably for large-scale use, he said, by liquefaction and rectification of air.

Continuing the discussion, he pointed out that there are two main cycles in the process of separating oxygen from air. These are the classical Linde or high pressure cycle and the Claude or low pressure cycle. A series of slides illustrated these cycles.

Tackling the subject of underground gasification of coal, Dr. Rushton declared that large oxygen plants are very expensive and that consequently coal should be gasified in carefully engineered projects where a high efficiency can be maintained. "The important question," he emphasized, "is still will these oxygen costs be low enough?"

Second part of the oxygen symposium was devoted to the report by Dr. C. C. Wright, School of Mineral Industries, State College, Pa., and L. L. Newman, Bureau of Mines, Washington, D. C., on the oxygen gasification of anthracite in the Wellman-Galusha producer. Summarizing the paper, Dr. Wright pointed out that the experiments were full scale plant tests of a standard ten-foot Wellman Galusha clean gas producer at Trail, British Columbia, using rice and barley anthracite.

The maximum gasification rates obtained, he added, were 3,110 and 1,660 pounds per hour with rice and barley anthracite, respectively. 'The compositions of the gas secured during the various tests were entirely satisfactory as raw synthesis gas and had a more desirable composition for this purpose than similar gas from coke operations."

Concluding conference feature was the composite preliminary study of adaptation of German experiences in complete gasification of coal with oxygen, presented by E. S. Pettyjohn, director, Institute of Gas Technology, Chicago.

Employing slides, Capt. Pettyjohn showed gas analyses and relative approaches to equilibrium in the different German operations. He described Winkler, Lurgi and other processes used in German gas plants.

"I do not believe that you would want to use many of the German processes directly," he remarked, "for their gas analysis is not as favorable as you have been led to believe." In conclusion, he emphasized that study of adaptation of German gas experiences is still in its infancy.

A. G. A. Purging Procedure Being Revised

J. S. Yeaw, Rochester; A. D. Harrison, Brooklyn, chairman; H. E. Ferguson, Chicago; (standing) C. J. Smith, New York; A. Gordon King, A. G. A.; H. S. Carpenter, Newark; G. R. King, Philadelphia; A. E. Wastie, guest; Gus Chabre, Los Angeles

REVISION of the American Gas Association's recommended procedure for removing and putting into service gas holders and other gas works apparatus, and gas mains, is well under way. Two former A. G. A. pamphlets giving recommended purging procedures are being rewritten by the Purging Committee under the chairmanship of A. D. Harrison, The Brooklyn Union Gas Co., and will be combined in one publication. New material will include a section on liquefied petroleum gases.

At a meeting of the committee at A. G. A. Headquarters in New York, June 5, proposed chapters prepared by individual committee members were reviewed and discussed. Chapters considered relate to inert gases, testing and instruments, purging apparatus, piping, holders and mains, and the purging of LP-gas equipment.

The committee was appointed in October, 1946, by C. S. Goldsmith, chairman of the Technical Section, and assigned the task of amplifying existing recommended procedures which have been successfully applied throughout the gas industry.

Accident Poster Series Started

THE Accident Prevention Committee, Howard T. Jayne, The Philadelphia Gas Works Co., chairman, plans through a subcommittee headed by E. C. Baumann, Public Service Electric and Gas Co., Newark, to produce a regular monthly series of posters dealing with accidents which occur within the gas industry. Mr. Baumann remarks:

"In an effort to capture the imagination and cooperation of both the employee and the employer, we have adopted for the next four months the slogan 'Let's Make This The Safest Place in The World.'

"Each poster will deal with a specific ac-

(Continued on next page)

cident problem and if used in conjunction with a planned safety program can help diminish the recent alarming increase in accidents.

"Perhaps you have a specific accident problem in your company? If a poster can help, send in your idea and we will try to incorporate it in the regular monthly poster.

"The posters can be duplicated or additional copies obtained without cost from the Secretary of the Committee, A. Gordon King, at American Gas Association headquarters."

Cast Iron Pipe Manual For Gas Industry

RECENTLY off the press after several years of preparation is an 88-page "Manual of Mechanical Joint Cast Iron Pipe and Fittings for the Gas Industry," published by the Cast Iron Pipe Research Association, Chicago.

This handsome, cloth-bound book, containing considerable information never before published, is of interest to executives, engineers, superintendents, purchasing agents and in fact anyone concerned with gas distribution and transmission.

Contents include weights of pipe, accessories and dimensions of fittings for standardized mechanical joint- pipe; large photographs showing assembly of the joint; numerous installation photographs of mechanical joint pipe in sizes up to 48-inch for low, medium and high pressures and a comprehensive collection of engineering tables, formulae and helpful hints, selected and checked by a gas engineering consultant. It is a valuable reference book for anyone responsible for design, purchase, installation or maintenance of pipe and fittings.

New Gas Carburizing Booklet Available

A NEW 16-page bulletin, SC-134, has recently been released by the Surface Combustion Corp., Toledo, Ohio, entitled "Modern Gas Carburizing Processes and Equipment."

The bulletin contains a comprehensive compilation on the subject of gas carburizing. It tells how modern gas carburizing is accomplished and explains the related processes of suspended carburization, carbon restoration and dry cyaniding. Applicable prepared atmospheres, their composition, use and method of preparation are described in this profusely illustrated booklet. Charts, graphs and tables add to its importance as a reference work.

Cleveland Address Change

THE Gas Machinery Co. of Cleveland and Harmon and Co., Engineers and Distributors, have moved their offices from 6 No. Michigan Avenue where they have been for the past 25 years to 208 Palmolive Bldg., 919 No. Michigan Ave.

Technical Conference Papers Available

PAPERS presented at recent conferences of the Technical Section have been printed and are now available for distribution as follows:

Distribution and Motor Vehicle Conference

An Approach to Driver Education by W. F. Brown, 25 cents; Job Classification and Evaluation—Why and How by James A. Whelpley, 25 cents; Installation of Gas Service Piping by E. L. Henderson, 30 cents; The Anodic Behavior of Sacrificial Metals in Specific Environments by K. M. Wight and R. F. Hadley, 30 cents.

Joint Production and Chemical Committee Conference

Chemical Treatment of Water Gas Tar Emulsion by S. A. Petrino, no charge; Developments in Oxygen Production by J. Henry Rushton and Earl P. Stevenson, 20 cents; Establishing New High Makes at Astoria by George L. Bixby, 15 cents; Experiences with Silicon Carbide Linings in Water Gas Generators by T. A. Corby, 30 cents; Future Possibilities in Methods of Gas Manufacture by Alfred R. Powell, 30 cents.

Interchangeability of Mixtures Containing Manufactured and Natural Gases with a 540 B.t.u. per cu.ft. Manufactured Gas by Jesse S. Yeaw and Louis Shnidman, 30 cents; Location of Internal Defects of Plant Equipment by Benson Carlin, 20 cents; Mechanical Dehydration of Coke Oven Tar Emulsion by E. W. Young, five cents; Operational Experience with Gas Interchangeability Problems in City Gas Distribution Systems by R. B. Paquette, 30 cents; Plant Practice in Mechanical Dehydration of Water Gas Tar Emulsions by A. G. Hall and A. R. Bayer, no charge; Production and Use of Oxygen by J. Henry Rushton and Charles R. Downs, no charge.

Research on the Mechanism of the Water-Gas Reaction by John F. Foster and Donald A. Vorum, 25 cents; Studies on Water-Gas Tar, First Annual Report on Cooperative Project PSC-1 by Dr. A. W. Gauger, C. R. Kinney, R. L. Struck, no charge; The Oxygen Gasification of Anthracite in the Wellman-Galusha Producer by C. C. Wright and L. L. Newman, 25 cents; The Selection of Coals for the Manufacture of Coke by Charles C. Russell, 30 cents; Tonnage Oxygen by Charles R .Downs and J. Henry Rushton, 20 cents; Twin Generator Oil Gas Process for Production of High B.t.u. Gas by R. J. Chambers, 20 cents.

Requests should be addressed to Order Department, American Gas Association, 420 Lexington Avenue, New York 17, N. Y.

Chester Plant Tests New Gas Making Process

A SOLUTION of the gas shortage problem arising out of sharp increase in demands for gas during the winter months may be in the offing as a result of experiments now under way at Chester in the Tilghman Street plant of the Philadelphia Electric Co., it was announced by the company May 28.

The experiments involve a new method of manufacturing gas by the catalytic reforming of hydrocarbons. The project is under the direction of Edward G. Boyer, manager of the Electric Company's gas department, which serves a four-county suburban area outside of Philadelphia.

The experiments in producing gas by the catalytic reforming of hydrocarbons, now in progress at the Chester plant, were accepted as a research project by the American Gas Association which in turn commissioned the Institute of Gas Technology of Chicago to conduct the tests. Mr. Boyer was named chairman of the Association's committee appointed to develop this project.

Work on the project commenced when a pilot plant was erected at the Chester Station in recent months. It is a self-contained gas manufacturing unit in miniature having its own steam boiler, air blower, reaction gas pump furnace, and safety and other operational controls necessary to the manufacture of gas. The eventual construction of a large permanent plant utilizing the methods proved in the pilot plant is predicated on the success of the experimental model.

Pilot plant work to date has been restricted to tests of catalysts and a commercial grade of propane gas. It is planned to test other hydrocarbons such as butane, naphthas, refinery oil gas, and gas oil, as well as other catalysts. According to Mr. Boyer, "The initial tests have been encouraging, but much work remains to be done before any real appraisal can be made of the process as applied to the manufactured gas industry."

UNDERGROUND GASIFICATION

(Continued from page 336)

were introduced alternately with air, for steam combines with carbon at high temperatures to produce the desired carbon monoxide and hydrogen. Gas qualities obtained were not as good as is deemed possible, partly because the light overburden and leakages prevented using air under high enough pressures. However, the gas was used for a small field boiler. Higher pressures, temperatures, and gas velocities, insuring quick removal of the gases before contaminating reactions occurred, would produce better quality gases, Mr. Elder said.

Discussing the excavating and mining conducted after the fire was extinguished to learn what had occurred underground, James J. Dowd, Bureau mining engineer, said that temperatures still exceeded 200 degrees even after steam was forced through the mine for five days and water for eight days in an effort to cool it. Workers were able to remain in the mine only for short periods. At one time the still hot coal again burst into flame.

In driving adits and a bulldozer trench

(Continued on next page)

Laboratories

Approval Requirements Subcommittees Active

MODIFICATION and simplification of a number of approval requirements for gas equipment were reviewed during June by respective subcommittees of the Approval Requirements Committee.

The incinerator group adopted changes covering newly developed types of designs now appearing on the market. The appliance pressure regulator group concerned itself principally with expansion of present test procedure indicated by experience, and considered appropriate revisions.

The range committee adopted a number of proposals to simplify present requirements and reduce the number of tests necessary for approval. It also considered industry comments on proposed standards for dual oven combination ranges and adopted these requirements for early approval by the supervising committee.

Revisions of present standards agreed on by the gas range and incinerator groups now go to the industry for suggestions and criticism before final adoption. Also initiated during the month were proposed revisions to installation requirements for conversion burners by a special group appointed for that purpose.

Former Employees Rejoin Laboratories' Staff

THREE former employees of the American Gas Association Testing Laboratories in Cleveland, Paul D. Lawrence, Leon J. Buividas, and William B. Pizzini, have returned to the staff after a number of years spent elsewhere in the gas industry and armed forces.

Mr. Lawrence first started with the Laboratories in 1937, then joined the engineering department of the Richmond Radiator Co., where he engaged in the designing of gas equipment. During the early war years he was associated with the Glenn L. Martin Co. as a heating and ventilating engineer, dealing with special problems connected with production processes. Entering the Army, he served overseas in the European theatre as a captain in the Infantry. He is a graduate of Ohio State University with a degree in industrial engineering.

Leon J. Buividas, who left the Cleveland Testing Laboratories of the American Gas Association in 1944 to enter military service, has rejoined the staff.

Mr. Buividas was first employed by the Laboratories in 1942, immediately following his graduation as a chemical engineer from Tri State College. He served with the Navy in the Pacific as a lieutenant aboard personnel-carrying ships and oil tankers. He is now a member of the Laboratories testing staff in the central heating section.

Mr. Pizzini also first joined the Laboratories staff in 1937. In 1942 he entered the manufacturing field with the W. J. Schoenberger Co. of Cleveland. He entered the Navy in 1944 and served with the military government at Okinawa. In 1946 he returned to the Schoenberger Company.

Summer-Winter Hookup Survey Published

A FIELD survey summarizing opinions of customers, utility men, and gas equipment manufacturers concerning the summer-winter hookup for supplying year-round hot water service by means of a gas-fired house heating boiler has been published by the American Gas Association Testing Laboratories. Sponsored by the Committee on Domestic Gas Research and issued as Research Report 1060-B, Field Study of Domestic Hot Water Service from Gas-fired Boilers, the report describes the various types of systems commonly utilized and comments on their performance. The report was prepared as part of project DGR-3-CH of the Committee on Domestic Gas Research.

Use of such arrangements for supplying hot water on a year-round basis, its practicability, and comparative cost against use of separate water heaters is somewhat controversial in the gas industry generally, but in certain sections of the country it is definitely a factor in the competitive market. Principal acceptance of the summer-winter hookup was found in territories where liquid fuel is popular and hot water and steam are commonly used for house heating. Most of the boilers examined were designed to use fuels other than gas, but had been converted to gas by means of conversion burners.

Despite the known comparative inefficiency of the summer-winter hookup for supplying hot water during the summer months, from an operating standpoint, it was noted that in those areas where it is competitive, it was found satisfactory on the whole both by customers and many gas utilities. Newer installations examined employed built-in water heating coils while the majority of the older units had heat exchangers mounted external to the boilers. If completely built gas-designed units were generally available they would insure installations of improved appearance, improved economy, and would simplify installations. Damp cellars, too, were found to be an important factor of consumer acceptance of the summer-winter hookup. Where damp cellars during the summer are a problem, use of such systems resulted in drier basements.

Average monthly water heating costs and gas consumptions for such systems for summer months were obtained from the files of several utility companies and are tabulated in an Appendix to the research report. Similar data of a conclusive nature were not available for the house heating season, but it was the opinion of utility engineers that fuel consumption for hot water service for three or four months without house heating, was roughly equivalent to one-half the total fuel used for this purpose during the entire year. A recent University of Illinois investigation made with oil-fired equipment indicates that this fuel consumption ratio is approximately correct.

For territories where data were gathered, results indicate that the cost of operation compares favorably with a separate boiler and domestic water heater on a year-round basis. These figures are tabulated for three separate territories giving average gas consumption and average cost. In most instances the operating costs favor the separate water heaters, but are offset by consumer preferences and lower initial investment cost claimed for combination units, making the difference insignificant.

Utilization engineers interviewed during this investigation expressed the opinion that the gas-fired summer-winter hookup could be used most profitably in installations requiring a heat input of 80,000 B.t.u. per hour or more. They also felt that unusually large installations, of 250,000 B.t.u. or more, should be analyzed carefully to determine whether enough hot water demand exists to warrant the cost of boiler standby losses encountered during summer months.

UNDERGROUND GASIFICATION

(Continued from page 366)

into the mine after the fire was extinguished, the workers in turn encountered intact coal, slightly carbonized coal, coke, fused clay from bags which had been stacked along the tunnel to confine the flames, and then the folded and expanded roof material over a thin bed of ashes where the coal had been burned out completely. The conferees agreed that a problem remaining to be solved is a practical method of confining the flames to the desired area so that they will not encroach upon neighboring properties in any given coal bed. The clay bags proved inadequate.

Personal and Otherwise

Hargrove New President of Texas Eastern

R. H. Hargrove

E. H. Poe

R. H. HARGROVE, president of the American Gas Association, was elected president and general manager of the Texas Eastern Transmission Corp. to succeed E. Holley Poe, at a recent meeting of the board of directors. Mr. Poe has served as president since the firm's incorporation.

Mr. Poe told the directors that since the organization period was successfully concluded and the company was in operation serving gas through the Big and Little Inch pipelines to eastern markets, he felt that the demands which would be made upon his time would make it impossible for him to resume the responsibilities and do justice to his consulting business. He will continue as a director and his services will be available to the corporation in a consulting capacity.

Others officers elected were: E. R. Cunningham, Shreveport, vice-president and operating manager; Charles I. Francis, vice-president; O. S. Carpenter, formerly of Austin, Texas, controller, and Herbert J. Frensley of Houston, reelected secretary-treasurer.

George R. Brown, chairman of the board of Texas Eastern, announced that stockholders had elected the following directors to serve during the ensuing year: August Belmont and Mr. Poe of New York City, Mr. Francis, Herman Brown and George R. Brown of Houston, E. DeGolyer of Dallas, and Mr. Hargrove of Shreveport, Louisiana.

Both Mr. Hargrove and Mr. Cunningham have been engaged in the natural gas business for many years and for approximately the past 20 years have served in administrative and executive capacities with United Gas Corp. or its subsidiaries. Mr. Hargrove attended Rice Institute and lived in Houston for ten years preceding 1940. Mr. Cunningham attended Texas A & M college and was a resident of Houston for many years.

Mr. Carpenter is a certified public accountant and attorney, former Texas State auditor and former chairman of the Texas Unemployment Compensation Commission.

Corporation and financial affairs of the company will continue to be handled at Houston and New York. Supervision of company operations will be handled from offices located at Shreveport and Cincinnati.

Warner Resigns From Gas Service Company

THE resignation of Harry Warner as secretary-treasurer and a director of The Gas Service Co., Kansas City, Mo., has been announced together with the election of a number of new officers.

R. M. Power, rate engineer, was elected first vice-president and director T. J. Strickler, formerly vice-president and general manager of the Kansas City Gas Co., was elected vice-president in charge of Kansas City, Mo., operations. C. H. Waring, formerly vice-president of The Wyandotte County Gas Co., was elected vice-president in charge of Kansas City, Kansas, operations.

James R. Abercrombie was promoted from assistant secretary-treasurer to treasurer. Ira W. McKee, formerly of The Wyandotte County Gas Co., was elected secretary. Ralph A. Barker, assistant secretary, and Arthur F. Anderson, Gas Advisers, Inc., New York, were each elected assistant secretary and assistant treasurer. Charles H. Koinm, general superintendent of the company, was appointed assistant to the general manager.

Manufacturers Light and Heat Promotion

C. F. Waterman

C. F. WATERMAN, head of the plant accounting department of The Manufacturers Light and Heat Co., Pittsburgh, has been elected an assistant treasurer of the company. Mr. Waterman is a member of the rate committee of the American Gas Association.

He entered the Columbia Gas System in 1927 and his first duties were as chemist in Columbus, O. A short time later he transferred into the rate department.

In 1937, Mr. Waterman came to the Pittsburgh general offices of The Pittsburgh Group of natural gas companies in the Columbia Gas System. He assumed charge of property records and later took over various phases of rate analysis and property tax accounting.

Otto Appointed Laclede President

L. W. Childress

JUDGE ROBERT W. OTTO was appointed president of The Laclede Gas Light Company, St. Louis, Mo., succeeding L. W. Childress, effective June 1. Mr. Childress will continue to serve as chairman of the board of directors. Judge Otto came to Laclede in 1933 as general counselor. Shortly thereafter he was made vice-president and became a member of the board of directors.

Mr. Childress, in retiring from the presidency, expressed great appreciation to his associates for their cooperation and loyalty to the company and its basic corporate policies to secure new consumer advantages in economic gas distribution to the Metropolitan area of St. Louis west of the Mississippi.

Pittsburgh Utility Elects Treasurer

C. A. Massa

AT a recent meeting of the board of directors, Charles A. Massa was elected treasurer of The Manufacturers Light and Heat Company, Pittsburgh. C. E. Bennett, president, revealed in making the announcement that Mr. Massa has been senior assistant treasurer since November, 1946.

The new treasurer joined the Columbia system of natural gas companies in February, 1930. Assuming the responsibilities of a rate engineer, he had initial headquarters in Columbus, O., and a few months later came to Pittsburgh in the same capacity.

In June, 1935, he became tax agent and chief statistician for The Pittsburgh Group of the Columbia natural gas companies, of which The Manufacturers Light and Heat Co. is a part. Mr. Massa will continue to make Pittsburgh his headquarters.

Cleveland Control Installs Brummage as President

RICHARD L. BRUMMAGE has been elected president of the Cleveland Control of the Controllers Institute of America. Mr. Brummage, controller of Dresser Industries, Inc., succeeds Phillip W. Scott, secretary-treasurer of Bryant Heater Company.

Other new officers of the Cleveland Con-

trol, which takes in all of northern Ohio, include Ralph H. Smith of the Cleveland Electric Illuminating Co., vice-president, George C. Houck of Harris-Seybold Co., secretary and Hallie J. Ensign of Willard Storage Battery Co., treasurer.

Directors chosen recently after the group's annual golf party and dinner at the Canterbury Country Club are Ogden Ashley of Cleveland Pneumatic Tool Co., A. C. Gay of William Taylor & Son, S. E. Hippensteele of Allied Oil Co., Inc., R. C. Huelsman of Central National Bank of Cleveland, M. E. Price of Thompson Products Co., Llewelyn Reese of Sherwin-Williams and George T. Zack of The White Motor Company.

Gas Advisers Elects Vice-Presdent

K. E. Crenshaw

KIRBY E. CRENSHAW, a director of Gas Advisers, Inc., since 1943, has been elected a vice-president of that company.

A graduate of North Carolina State College of Agriculture and Engineering, Mr. Crenshaw served in various operating and engineering capacities with Cities Service Gas Co. from 1930 to 1940. In 1940 he was transferred to Gas Advisers, Inc., to engage in engineering and technical services of that organization for the natural gas subsidiaries of Cities Service Company.

Texas Group Elects May

CHESTER L. MAY, vice-president, the Lone Star Gas Co., Dallas, Texas, has been elected president of the Texas Manufacturers Association located in Houston, Texas.

New Tappan Sales Head

D. S. Sharp

THE promotion of D. S. Sharp to sales manager of the Tappan Stove Co. has been announced by A. B. Ritzenthaler, vice-president in charge of sales.

Mr. Sharp joined the Tappan organization in 1936 and was southern Ohio sales representative until 1942 when he joined the Jeffersonville, Ind., Quartermaster Corps as procurement specialist.

He rejoined Tappan in 1944 as director of retail sales training. In September 1945, he was promoted to assistant sales manager.

Pacific Gas and Electric Company Reports Executive Personnel Changes

W. G. B. Euler

WILLIAM G. B. EULER, vice-president of Pacific Gas and Electric Co. in charge of operations, became vice-president and general manager of the company July 1, according to an announcement of executive personnel changes by James B. Black, P. G. and E. president.

A. Emory Wishon, whom Euler will succeed in the top managerial post, became executive vice-president. Mr. Wishon will assist the president in general supervision and will direct the department of general construction now engaged in a $300 million expansion program.

Mr. Black also announced the retirement of R. E. Fisher, vice-president in charge of public relations and sales, and the elevation of four P. G. and E. executives to vice-presidencies. The changes are effective July 1, and the average company service of the men involved is 35 years.

Mr. Fisher, having reached retirement age, leaves the company after 36 years of service, 25 as vice-president. He has long been a prominent leader in civic affairs in California and the San Francisco Bay region.

A. E. Wishon

R. E. Fisher

N. R. Sutherland

I. C. Steele

D. D. Smalley

J. S. Moulton

Norman R. Sutherland, manager of the company's San Francisco division since 1945, has been named to succeed Mr. Fisher. A native of San Francisco, he has been with P. G. and E. since 1913 when he was first employed in the San Francisco division office as a clerk.

Dunlap D. Smalley, engineer of electric operation, will succeed Mr. Euler as vice-president in charge of operation. Mr. Smalley, who has been with the company since 1910, was general superintendent of the San Joaquin and Midland Counties properties of the firm prior to his appointment last year as engineer of electric operation.

James S. Moulton, executive engineer, was appointed vice-president and executive engineer. He has been with the company since 1921, having joined the San Joaquin Light and Power Corporation's engineering staff in 1920. He later became executive engineer of the Great Western Power Co., then assistant to the vice-president and general manager, and last year executive engineer.

I. C. Steele, chief engineer, was appointed vice-president and chief engineer. A recognized authority on dam construction and hydraulic structures, Steele took his first job with P. G. and E. in 1909.

Euler, a native of San Francisco and a graduate of the University of California, is a veteran in utility service, having joined the engineering staff of the Great Western Power Co. in 1910. He was general superintendent of Great Western's operations at the time of its merger with P. G. and E. and shortly thereafter was transferred to P. G. and E.'s headquarters in San Francisco. He became chief engineer in 1940, and vice-president in charge of operations January 1, 1944.

There are two other vice-presidents in the P. G. and E. organization, John P. Coghlan and L. Harold Anderson.

Boss Made California Sales Representative

APPOINTMENT of Marvin F. Boss as sales representative for the state of California has been announced by Roberts & Mander Corp., Hatboro, Pennsylvania.

Mr. Boss will divide his time between the two "Quality" district offices in San Francisco and Los Angeles. He was formerly in charge of Quality sales in southern California, and now takes over the northern California territory as well, replacing G. R. Porter who has resigned.

New Jersey Gas Men Get New Posts

J. P. Leinroth

H. P. Morehouse

H. A. Sutton

NEW assignments in the Public Service Electric and Gas Co., Newark, N. J., have been released by George H. Blake, president. J. P. Leinroth is now sales manager for gas, succeeding James P. Hanlan who retires in July. Mr. Leinroth will also continue in charge of industrial and commercial fuel sales.

H. Preston Morehouse is new assistant sales manager, gas, in charge of all activities relating to the sale of residential gas appliances, promotion of the use of gas for residential purposes and promotion of the use of electricity and gas for air conditioning and building heating.

Harry A. Sutton is assistant sales manager, gas, in charge of all activities relating to the promotion and use of electricity and gas in industrial process heating, commercial refrigeration and commercial process heating.

Mr. Leinroth has been with Public Service 25 years and during that time has been active in the Industrial and Commercial Gas Section of the American Gas Association. For the last 13 years he has been chairman of the section's Advertising Committee and has been responsible for the growth of industrial and commercial advertising to the present overall comprehensive program it is today. He was chairman of the Industrial and Commercial Gas Section in 1929, is past president of the New Jersey Gas Association, and is currently a member of the A. G. A. Industrial and Commercial Gas Research Committee.

Another member of Public Service's 25-year club is Mr. Morehouse, who has been active in A. G. A. affairs for many years, serving on numerous committees. His most outstanding accomplishment is completion of the Residential Section's Architects Manual.

Mr. Sutton, who has been with the company since 1921, has been identified with the A. G. A. Industrial and Commercial Gas Section for many years. He has made numerous contributions to the section's activities, and served as chairman in 1946. Most recently he was Program Chairman for the 1947 Sales Conference, and is now on the Managing Committee and chairman of the Nominating Committee. Both Mr. Sutton and Mr. Leinroth are charter members of the Industrial and Commercial Hall of Flame, the honorary organization of Industrial and Commercial Gas Men.

Fisher Retires From Rochester G. & E.

FREDERICK W. FISHER, for the past 20 years director of Personnel and Public Relations, Rochester Gas and Electric Corp., was honored June 22 at a farewell party, marking his retirement from that organization after more than 38 years of service.

Mr. Fisher has been one of the most active workers on the Personnel Committee of the American Gas Association. At a recent meeting of that Committee a resolution was adopted paying tribute to his many contributions.

Mr. Fisher joined the Rochester utility in 1909 as a field engineer, later becoming safety and construction engineer. In 1910 he was engineer in charge of the major hydro-electric development of the Rochester company, a project that called for the building of a tunnel nearly a third of a mile long and 100 feet below solid rock. In 1918 he was made employment manager and in 1927 director of the newly created Department of Personnel and Public Relations, a post which he held up to the time of retirement.

Chairman of the Board of Directors Herman Russell, President Alexander M. Beebee and other associates paid tribute to Mr. Fisher's years of service at the farewell party and presented him with a large sterling silver vase.

Dallas Advertisers Honor Roberts

L. C. Roberts

L. C. ROBERTS, advertising supervisor, Lone Star Gas Co., Dallas, was elected president of the Dallas Advertising League at its annual election Friday, May 30. The League is Dallas' oldest luncheon club and one of its largest.

The new president, a member of the Advertising League 15 years, was selected the League's most valuable member in 1945. He has been connected with Lone Star Gas Co. 14 years and some of his advertising there has won top honors in P.U.A.A. and other competitions.

Among his predecessors in the office of president is Will C. Grant, formerly Lone Star's advertising director.

Reynolds Retires From Boston Consolidated

D. S. Reynolds

DAVID S. REYNOLDS, vice-president and chief engineer of the Boston Consolidated Gas Co., was retired June 1. Mr. Reynolds has for many years been active as chairman or member of various committees of the American Gas Association. He is president of the Guild of Gas Managers and in 1945-1946 was president of the New England Gas Association.

He joined the gas industry in 1902 as a draftsman with the Boston company, a year before his graduation from Massachusetts Institute of Technology. His first assignment was to draw plans for the Company's proposed new gas plant. From those early plans grew the present large manufacturing plant at Everett, Mass.

From his start he became chief draftsman in charge of drafting and designing, construction engineer in 1917, and subsequently manager of house heating, chief engineer, assistant treasurer and finally a vice-president.

United Gas Corp. Elects Vice-Presidents

H. P. CARROLL and E. L. Henderson, operating manager and assistant operating manager respectively, United Gas Corp., Houston, Texas, were elected vice-presidents at a recent meeting of the corporation's board of directors.

Simultaneously, announcement was made of organizational changes within the operating division of United Gas Corporation. Under the new plan this division will be divided into "Texas Operations" and "Louisiana-Mississippi Operations."

N. C. McGowen, president of the companies, stated that Mr. Henderson will supervise the distribution operations in Louisiana and Mississippi as general manager; Mr. Carroll will serve as operating manager of "Texas Operations."

Mr. Carroll began his long career in the utility field with what was originally the old Beaumont Gas Light Company. He was made manager of the Beaumont territory by one predecessor company and continued in that capacity under the next predecessor firm. He was transferred to Houston as operating manager in 1930 and when United Gas companies took over the facilities later that year he was moved to the general office as assistant operating manager. He was appointed operating manager in 1939.

Mr. Henderson, active in the American Gas Association, is chairman of a Technical Section Subcommittee on Construction and Maintenance, and participated in the spring Distribution and Motor Vehicle Conference.

He had his early experience in the natural gas field in Ohio as engineer and superintendent of natural gas distribution and transmission properties. In 1931 he entered the service of a predecessor company as engineer in charge of distribution. He became chief engineer of the operating division in 1937 and later assistant operating manager.

Other personnel changes included appointment of J. C. Flanagan, vice-president of the corporation, as general manager of Texas Operations properties.

Mrs. Crosthwait Conn. L & P Home Servce Supervisor

Mrs. G. Crosthwait

MRS. GERTRUDE M. CROSTHWAIT has been appointed supervisor of Home Service, The Connecticut Light and Power Co., with offices in Waterbury.

Mrs. Crosthwait has a wide experience in the utility field. She began her association with the sales department in the company's Meriden district in 1941. In 1944, she was made secretary to company president C. L. Campbell, in Hartford, in which capacity she remained until her recent appointment.

As Supervisor of Home Service, Mrs. Crosthwait will arrange for and conduct cooking, home lighting, and appliance demonstrations. She will be responsible for the development of the company's extensive home service program and will work closely with home service personnel and appliance dealers throughout Connecticut Light and Power Co. territory.

Shanley Promoted in Accounting Section

T. J. Shanley

THOMAS J. SHANLEY has been appointed assistant secretary of the Accounting Section of the American Gas Association, effective June 1 and will serve under Walter E. Caine, present secretary of the Section.

Mr. Shanley joined the American Gas Association as a statistical clerk, July 9, 1934. Since that time he has served as assistant statistician under Paul Ryan, chief statistician, and supervisor of the Statistical Research prior to entry into military service in 1943.

Upon release from the Army, he rejoined the A. G. A. in February 1946, serving as statistical analyst under Mr. Caine. Mr. Shanley is currently studying accounting at New York University.

Philadelphia Electric Official Retires

H. H. Ganser

H. H. Ganser has retired as regional vice-president of the Philadelphia Electric Co. at Norristown.

Mr. Ganser served with the utility 48 years, starting as a delinquent bill clerk in what was then known as the Gas Company of Montgomery County and Norristown Electric Light and Power Company.

He is a member of the American Gas Association, the American Institute of Electrical Engineers, the Engineers Club of the United States, the Pennsylvania Electric Association and Pennsylvania Gas Association.

Carpenter Appointed A. M. A. Director

I. M. Carpenter

I. M. CARPENTER, manager, Insurance Department, Ebasco Services, Inc., New York, was appointed a director of the American Management Association during the annual meeting of the membership June 11. Mr. Carpenter is chairman of the Insurance Committee of the American Gas Association. In 1946 he was elected vice-president of the Management Association in charge of the Insurance Division.

Charleston Companies Select New President

O. S. Hagerman

OLIVER S. HAGERMAN has been elected president and general manager of the Charleston group companies of the Columbia System to succeed Harry A. Wallace, Jr., who is retiring, to enter the oil and gas business in Charleston. Both men are active members of the American Gas Association.

Mr. Hagerman had served as vice-president and general manager of the Charleston group of companies of the Columbia Gas & Electric Corp. since spring 1946. Before going to Charleston he was connected with the Atlantic seaboard group of Columbia subsidiaries. Prior to 1937 he was associated with the American Light and Traction Company.

Mr. Wallace has held various positions in the Columbia System for 20 consecutive years. He was elected president of United Fuel in 1943, succeeding his father, Harry A. Wallace, Sr., who retired.

Mr. Wallace began his career with the system in Charleston in 1927. In August 1928 he was appointed assistant geologist of The Ohio Fuel Gas Co. with headquarters in Columbus. In May 1930 he left Columbus for Binghamton, N. Y. where he served until 1937 as field manager for the New York group of Columbia affiliates. He returned to Charleston the same year as vice-president of United Fuel Gas.

Philadelphia Electric Officers Promoted

H. P. Liversidge

H. B. Bryans

N. E. Funk

HORACE P. LIVERSIDGE has been elected chairman of the board of directors of the Philadelphia Electric Company. He has been president since 1938 and will continue as executive head of the company.

Concurrently, Mr. Liversidge announced the election of H. B. Bryans, executive vice-president, as president and N. E. Funk, vice-president in charge of engineering, as executive vice-president and a director.

Mr. Bryans has spent his entire career in the public utility business, beginning with The Philadelphia Gas Works Company. Later he continued in the gas field in Kansas City, Mo., and natural gas in Kansas. He first entered the electric utility field in Gloversville, N. Y., and later became engineer of the Counties Gas and Electric Co. in Norristown, Pa. He was subsequently appointed general superintendent and later assistant general manager of the Philadelphia Suburban Counties Gas & Electric Company. In 1929 he was named vice-president in charge of operations of the Philadelphia Electric Co., and was elected executive vice-president in 1938.

Mr. Bryans is a member of the American Gas Association, a director and past-president

of the American Standards Association, president of the Electrical Association of Philadelphia, director of the Edison Electric Institute and a past-president of the Pennsylvania Electric Association.

Mr. Funk has been with the Philadelphia Electric Co. for many years and is a national authority on engineering matters.

He has been active in many national associations and societies, including the American Institute of Electrical Engineers, of which he is a past national president; the American Society of Mechanical Engineers, of which he is now a vice-president; the Association of Edison Illuminating Companies, the Edison Electric Institute, the Pennsylvania Electric Association, the National District Heating Association and The Franklin Institute.

Davis Gets New Post at Equitable Gas

W. E. Davis

WILLIAM E. DAVIS has been appointed supervisor of trade and dealer relations, Equitable Gas Co., Pittsburgh.

Born in Parkersburg, W. Va., Mr. Davis was graduated from Carnegie Institute of Technology's School of Fine Arts in 1934, with a B.A. degree in architecture. He entered the employ of the utility in April 1935 and has since served in various sales capacities, as heating layout designer, trade development representative, in engineering capacities, and as supervisor of architects and builders services, the position he held at the time of his present appointment.

Howard Receives Kaiser Sales Post

ALFRED D. HOWARD, formerly assistant sales promotion manager of Servel, Inc., has been appointed assistant general sales manager of Kaiser Fleetwings Sales Corp., Oakland, Calif., and Bristol, Pennsylvania.

Mr. Howard was selected to assist General Sales Manager Paul L. Yager in the marketing of the firm's new dishwasher. For the time being Mr. Howard will supervise the territory east of the Mississippi from Bristol while Mr. Yager works out of the general offices in Oakland.

Mr. Howard began his selling career with the Kelvinator Corp., and joined Servel, Inc., in 1932.

U. G. I. Appointment

CLARENCE A. WARDEN, JR., executive vice-president of Superior Tube Co., has been elected a director of The United Gas Improvement Co., Philadelphia.

Mueller Furnace Creates New Sales Districts

TWO new sales districts, the Central and the North district, have been established by the L. J. Mueller Furnace Company, Milwaukee.

Sales Manager for the Central District, which has headquarters in St. Louis, is Robert N. Rosebrough, who has been with the company for 34 years. He will be assisted by his son, J. Stoddard Rosebrough, who has been associated with Mueller for 17 years. Comprising the Central District are Missouri, Kansas, Nebraska, Colorado, western Iowa, southern half of Illinois, southwestern Indiana, western Tennessee and the bulk of Kentucky. Arkansas and Oklahoma are temporarily included.

The new Northern District is managed by R. Dean Hearne, with headquarters at the home office in Milwaukee. Assisting Mr. Hearne are Tom Brice, Harry B. McKee, E. A. Liessman and Elmore Scheck. Included in the Northern District are Wisconsin and Minnesota, central and eastern Iowa, northern half of Illinois, and northwest Indiana.

Gussie Jones Wins Ad Club Award

A PLAQUE giving honorable mention "for outstanding creative advertising produced by a woman" has been presented to Gussie O. Jones, advertising manager of The Atlanta Gas Light Co., Atlanta, Ga., by the Women's Advertising Club of St. Louis.

Known as the Erma Proetz Award, the citation was established three years ago in memory of a former club president. Miss Jones received the award in recognition of her work on a series of nine historical advertisements which were published last fall and appeared in *The Atlanta Journal*.

Miss Jones is active in the gas industry and a member of the Domestic Gas Copy Committee of the American Gas Association for a number of years.

Reeder Gets Sales Post At Duo-Therm

R. H. Reeder

R. H. REEDER has been named Duo-Therm Division sales manager by Motor Wheel executive vice-president M. F. Cotes.

Formerly Eastern district manager for Duo-Therm, Mr. Reeder assumed his new duties June 1. He has been associated with the division for the past ten years.

Mr. Reeder spent his first two years with Duo-Therm as district manager for the Southwest territory. Following this he travelled extensively for a year on a special assignment in field analysis.

While serving as district manager in the East, he received a wartime leave of absence to take a position with the Radar Research and Development Laboratory of the Massachusetts Institute of Technology. He returned to Duo-Therm on October 1, 1945.

Lydecker Honored By Stevens Institute

F. A. Lydecker

FREDERICK A. LYDECKER, vice-president in charge of gas operation, Public Service Electric and Gas Co., Newark, N. J., was honored on June 7 at the annual commencement exercises of Stevens Institute of Technology, Hoboken, N. J., when he was one of five to receive the honorary degree of Doctor of Engineering.

A graduate of Stevens, Class of 1907, Mr. Lydecker has been employed by Public Service for 39 years in technical and executive positions. He has long taken a very active interest in the affairs of Stevens Institute and in promoting the work of the Alumni Association.

Frazier Chosen Trion Sales Manager

J. W. Frazier

JOHN W. FRAZIER has been appointed general sales manager of Trion, Inc., McKees Rocks, Pennsylvania, formerly Pittsburgh Range Company.

Mr. Frazier has been identified with Equitable Gas Co., Pittsburgh, since 1936, serving successively as house heating salesman, architect and builder representative and residential heating supervisor. He was supervisor of dealer relations when he left the company June 1 to accept the new position.

As general sales manager, Mr. Frazier will direct all sales and sales promotion activities of the company, which is building an electrostatic precipitator for homes and commercial establishments. The Trion Air Filter is designed for use in connection with warm air heating systems.

Mr. Frazier, who has been active in the heating industry, is the author of "Forestalling Heating Headache," in the October 1946 AMERICAN GAS ASSOCIATION MONTHLY.

Pittsburgh Utility Names Home Service Director

R. M. Jernstrom

REGINA M. JERNSTROM has been named home service director for District Number 6 of The Manufacturers Light and Heat Co., Pittsburgh. W. L. Hutcheson, sales manager, in making the announcement explained that Miss Jernstrom replaces Evelyn M. Porter who resigned prior to her recent marriage.

The new home service director received her Bachelor of Science Degree in home economics from Mt. Mercy College, Pittsburgh. As a home economics instructor in the Pittsburgh school system, she taught classes in food preparation and clothing design.

Miss Jernstrom has taken graduate work at both the University of Wisconsin and the University of Pittsburgh. Prior to joining the staff of home service directors who work under the general supervision of Flora Dowler, company home service supervisor, Miss Jernstrom was a home service representative in Pittsburgh for Equitable Gas Company.

New Tappan Directors

A. B. RITZENTHALER, vice-president in charge of sales of the Tappan Stove Co., Mansfield, O., was one of three persons recently elected to serve on the board of directors, Alan P. Tappan, president, has announced.

The other two members are William R. Mabee, plant superintendent and Harold O. Dysart, secretary. Mr. Ritzenthaler has been with the company 21 years, Mr. Mabee, 20 and Mr. Dysart, 25.

Caloric Appointment

ROGER G. STILLMAN has been appointed New England Divisional representative of Caloric Stove Corp., Philadelphia, with headquarters in Wilmington, Massachusetts.

Mr. Stillman has been a member of the company's sales organization since 1945 and is thoroughly familiar with the New England area. He has had 14 years' experience in the gas industry, particularly the LP-gas sector, and has been actively associated with the Pennsylvania Gas Association.

New Cribben & Sexton Sales Representative

THE appointment of Roy C. Johnson as Cribben & Sexton sales representative in Northern California, Nevada, Oregon and Washington, has been announced by Harold E. Jalass, general sales manages. Mr. Johnson will operate under the supervision of Charles R. Woodson, Pacific Division manager.

Mr. Johnson has had 20 years' experience in the gas range industry on the Pacific Coast, covering both the retail and wholesale field. For 18 years he was connected with the Dohrman Commercial Co., operating the appliance department of the H. C. Capwell Co. Department Stores in Oakland. For seven years he was manager of the range department of Jackson Furniture Co. in Oakland. He has been associated with Gas Appliance Society activities in the San Francisco Bay area and has worked in the National "CP" Range campaigns.

Indianapolis Ad Agency Opened by Saas

G. A. Saas

GEORGE A. SAAS has announced the opening of an advertising agency on June 1, 1947, in the Hume Mansur Building, Indianapolis. The new agency, known as G. A. Saas and Co., specializes in advertising, sales promotion, and human relations work, in the industrial and manufacturing fields.

Since February, 1939, Mr. Saas has been advertising manager of the Citizens Gas and Coke Utility, handling advertising, sales promotion, and public relations. He was formerly a member of the American Gas Association's Advertising Copy Committee and the A. G. A. Customer Relations Committee. Previous to entering the gas utility field, Mr. Saas was engaged in newspaper advertising work.

Wilson Selected By N. A. P. A. Buyers' Group

C. F. Wilson

CHARLES F. WILSON, supervisor of Stores for Lone Star Gas Co. with headquarters in Dallas, Texas, was elected general chairman of the Public Utilities Buyers' Group of the National Association of Purchasing Agents in convention in New York June 4. Mr. Wilson served as vice-chairman last year. He is president of the Dallas Association of Purchasing Agents.

Other officers of the group include George H. Cole, Alabama Power Co., vice-chairman; Chet F. Ogden, Detroit Edison Co., vice-chairman; Stephen J. Kennedy, Springfield (Mass.) Gas Light Co., vice-chairman; Robert N. Dowling, New Orleans Public Service Co., secretary-treasurer.

Rodey Promoted at Consolidated Edison

BERNARD S. RODEY, JR., in charge of the tax department of Consolidated Edison Co. of New York, Inc., was elected an assistant secretary of the company May 27. He had been associate controller of the utility since 1936.

Mr. Rodey has been with the Consolidated Edison System since 1921. He is an attorney and a licensed professional engineer in the State of New York, but is principally identified with his work in connection with public utility accounting policies and practices.

N. Y. S. E. & G. Advancements

ARNOLD W. MILLIKEN, vice-president and newly-elected member of the board of directors of the New York State Electric & Gas Corp., Ithaca, N. Y., has been placed in charge of technical operations and will assume additional duties under three advancements announced by Ralph D. Jennison, president.

David A. Lewis, Eastern Division manager, will come to Binghamton as assistant to Mr. Milliken. William G. Rhodes, new business manager of the Eastern Division, will succeed Mr. Lewis as division manager with headquarters at Brewster. Mr. Milliken will have headquarters in Binghamton and will assume many of the duties of the late William G. Hickling, vice-president and general manager.

He started his utility career in 1922 as a results engineer in the power plant of the New Bedford (Mass.) Gas & Edison Light Company. In 1924 he became assistant to the manager of the electric department and in 1930 manager of the department. Later he became assistant general manager of the company and remained in that capacity until February 1939, when he was made vice-president and Eastern Division manager, with headquarters in Brewster. In May 1945, he was appointed superintendent of operations on a statewide basis with headquarters in Binghamton.

P. U. A. A. AWARD WINNERS

(Continued from page 343)

cluded, Harold S. Metcalfe, West Penn Power Co., president; F. I. Fairman, Louisville, Ky., Herbert Briggs, Pittsburgh and William B. Hewson, Brooklyn, N. Y., vice-presidents; Ray W. Garvin, Monongahela Power Co., secretary, and Mead Schenck, Interstate Power Co., treasurer.

New directors elected included: W. S. Johnson, Wisconsin Power & Light Co.; Edgar Chestnutt, Arkansas Power & Light Co.; Walter G. Heren, Union Electric Co.; Paul Penfield, Detroit Edison Co., and C. Fred Westin, Public Service Corp. of New Jersey.

Associated Organization Activities

S. G. A. Gas Technology Short Course

GAS utilization and production and transmission problems occupied the attention of approximately 200 gas and oil industry members from 11 different states during the second annual Short Course in Gas Technology at Texas A & I College, May 27-30. Trips to South Texas dehydration plants and other gas installations highlighted the course which was sponsored by the Southern Gas Association. In general assemblies the men heard talks by J. A. Crichton of DeGolyer and MacNaughton, Dallas; Dr. Drew Mayfield, Celanese Corp., Bishop, Tex.; Captain E. S. Pettyjohn, director of the Institute of Gas Technology, Chicago, and R. M. Hutchison, research director, Houston Natural Gas Corp., Houston.

Mr. Crichton said that the conservative figure of more than 151 trillion cubic feet of recoverage gas reserves could more easily be 200 trillion cubic feet as far as national planning was concerned.

Captain Pettyjohn described research accomplished and in prospect at the Institute of Gas Technology.

Also on the general assembly programs were Frank C. Smith, president of the A & I board of directors and president of the Houston Natural Gas Corp.; President E. N. Jones of A & I; Robert R. Suttle, managing director of the Southern Gas Association; Frank S. Kelly Jr., Arkansas Louisiana Gas Co., Shreveport, chairman of the advisory committee, and Dean Otto R. Nielsen of A & I.

Production, Transmission

Mr. Hutchison was chairman of the production and transmission section, which included talks by A. L. Forbes Jr., Associated Contractors and Engineers, Houston, "Latest Pressure Welding Technique"; J. F. Dougherty and H. J. Gruy, DeGolyer and MacNaughton, "Methods of Estimating Natural Gas Reserves"; R. L. Barten, Foxboro Co., Houston, "Principles of Automatic Controls as Applied to Natural Gas Operations"; R. C. Buchan, Humble Oil and Refining Co., Houston, "Corrosion in Condensate Wells"; W. C. McGee Jr., Tennessee Gas and Transmission Co., Houston, "Improved Methods of Pipe Line Design."

At a well on the King Ranch a representative of the Baroid Company, Corpus Christi, gave a demonstration of continuous well-logging. Production and transmission students also saw a prediction of sub-surface gas flow by use of an electrolytic model table.

In the utilization program, outlined by Chairman George Elmer May, New Orleans Public Service, Inc., talks were given by A. M. Elder, Houston engineer, "Use of Gas in the Converted Rice Process"; W. O. Owens, Surface Combustion Corp., Toledo, "Special Applications of Natural Gas"; J. B. Winston, Clark and Winston, Weslaco, Tex., "Submersion Gas Burners"; H. Charles Pierce, Servel, Inc., Evansville, "Determining Summer and Winter Air Conditioning Loads"; Dr. R. S. Taylor, Servel, Inc., "Absorption Refrigeration Systems"; J. K. Hawk, Evans Engineering Co., Birmingham, "Dehumidification Systems"; I. A. Naman, University of Houston, "Advanced Techniques in Air Distribution"; Dale S. Cooper, Dale S. Cooper and Associates, Houston, "Control Methods as Applied to Gas Air Conditioning," and Dr. W. G. Hugly, research director, Southwestern Settlement and Development Corp., Houston, "Freezing and Dehydration for Food Preservation."

Movies covering long distance transmission pipeline construction and modern drilling techniques were shown during an evening session.

Canadian Gas Association Annual Convention Largest in Forty Years

F. A. Brownie

Thomas Weir

F. A. BROWNIE, executive assistant to the president, Canadian Western Natural Gas, Light, Heat & Power Co., Ltd., Calgary, Alta., was elected president of the Canadian Gas Association at the fortieth annual convention at Niagara Falls, Ont., June 9-11. A 40-year record crowd of more than 300 gas men and guests from Canada and the United States heard a wide assortment of speeches on subjects of vital importance to the industry.

The following officers and executive committee members were elected to assist Mr. Brownie in carrying on the affairs of the association: First vice-president—E. H. Rohrer, manager, Gas Department, British Columbia Electric Co. Ltd., Vancouver, B. C.; second vice-president—Alex. Mackenzie, sales manager, Foundry Division, General Steel Wares Ltd., Toronto, Ont.; executive secretary and treasurer—George W. Allen, gas sales survey engineer, Toronto, Ontario.

Executive members—Alan H. Harris, Jr., manager, Gas Utility, Winnipeg Electric Co., Winnipeg, Man.; G. W. Page, superintendent, Montreal Coke & Manufacturing Co., Montreal, Que.; Hugh G. Smith, secretary, Consumers' Gas Co. of Toronto, Toronto, Ont.; K. L. Dawson, superintendent, Gas Department, Nova Scotia Light and Power Co., Ltd., Halifax, N. S.; R. M. Perkins, manager, Windsor Gas Co. Ltd., Windsor, Ont.; C. M. Seiger, controller of Gas, United Gas and Fuel Co. of Hamilton Ltd., Hamilton, Ont.; Carl H. Lutz, division superintendent, Dominion Natural Gas Co. Ltd., Dunnville, Ont.; William Vickers, plant engineer, Public Utilities Commission, Kitchener, Ont.; D. B. McWilliams, managing director, Dresser Manufacturing Co., Ltd., Toronto, Ont.; J. M. Moffat, director, Moffats Ltd., Weston, Ont.; Thomas Weir, general manager, Union Gas Co. of Canada Ltd., Chatham, Ont.; W. J. Pead, Jr., chief engineer, Gas Department, Quebec Hydro-Electric Commission, Montreal, Quebec.

In his annual report to the association, Thomas Weir, Union Gas Co. of Canada, Ltd., Chatham, Ont., retiring president, stated that members of the gas industry in Canada "are fully aware of the opportunities ahead and will be in a position to meet the increasing demands as quickly as the necessary materials can be obtained." In 1946 gas sales reached a new peak, he said, of 57,427,790 M.c.f., slightly higher than 1945 and nearly 18 percent higher than 1938. He also reported that residential sales volume had increased 5.3 percent over 1945, more than offsetting the reduction in sales volume for industrial purposes arising out of postwar adjustments.

Distribution Film

Canadian and American gas distribution men in particular found much to comment on in an exceptionally well-presented 1,200 foot film entitled, "Methods and Tools Involved in Doing Distribution Work Through One-Foot Pavement Openings." Presented by The Peoples Gas Light and Coke Co., Chicago, and explained by Peter Bruck, superintendent, Central Division, the film proved to be a highlight of the entire convention. When time became short, C. S. Goldsmith, The Brooklyn Union Gas Co., who was scheduled to show and explain another film on "Safe Practices in Street Main Work," graciously turned the platform over to Mr. Bruck.

Other papers and addresses which attracted attention and comment included the following:

"Gas Manufacturing Trends in North America," by George F. Knight, general superintendent of works, Consumers' Gas Co. of Toronto; "A Practical Approach to Home Service," by Inez Somers, director of Home Service, Consumers' Gas Co., of Toronto; "Employee Training Plans of the American Gas Association" by George H. Smith, A. G. A. assistant managing director; "The Manufacturers' Responsibility in the Utility Business" by John A. Robertshaw, president, Robertshaw Thermostat Co., Youngwood, Pa.; "The 'CP' Programme for 1947-1948," by James I. Gorton, promotional director, Gas Appliance Manufacturers Association; "Specialty Selling in the Canadian Market," by James H. Welsh, divisional manager, Electrolux (Canada) Ltd., Toronto; "Customer Service Trends," by Schuyler F. Baldwin, operations supervisor, Gas Distribution Division, Rochester Gas and Electric Corp., Rochester, N. Y.

Among the prominent guests and well-known gas men taking part in the general sessions or banquet period was Dr. J. G. King, Gas Research Board, London, England, who also represented the Institution of Gas Engineers. At the Monday night banquet Dr. King, according to annual custom, handed over to the incoming president the Silver Salver of the I. G. E., originally presented to the association in 1933 as a memorial by the visiting Institution of Gas Engineers.

Also present were: H. Carl Wolf, A. G. A. managing director; H. Leigh Whitelaw, G.A.M.A. managing director; Lt. Col. R. B. Harkness, Natural Gas Commissioner for the Department of Mines, Toronto; R. M. Conner, director, A. G. A. Testing Laboratories, Cleveland, O.; R. Latreille, commissioner, Quebec Hydro-Electric Commission, Montreal, and numerous others.

The general membership unanimously adopted recommended revisions of the constitution and by-laws providing for formation of a Manufacturers' Section composed of Class C and D members of the association. The Section will appoint its own officers, at least two of its members will be elected to the general executive committee each year, and provisions will be made for a manufacturer to become an officer of the association. Another revision brought into being a new committee, "Advisory Council," composed of still active past-presidents of the association.

The Time and Place Committee presented a report approving Vancouver, B. C., and early June or July as the place and time for the 1948 convention. This committee also reported that the Pacific Coast Gas Association wished to cooperate in the Vancouver meeting.

Canadian Natural Gas and Petroleum Association Meeting Sets Record

An all-time record attendance marked the twenty-first annual convention of the Natural Gas and Petroleum Association of Canada, held at the Royal Connaught Hotel at Hamilton, May 22-23.

Unanimous reelection was accorded the following officers: honorary president, Major E. Sweet, Brantford; president, S. A. Morse, Union Gas Co., Chatham; first vice-president, S. B. Severson, Dominion Natural Gas Co., Buffalo; second vice-president, C. N. Glenny, Provincial Natural Gas Co., Fort Erie; treasurer, J. A. Richie, Dominion Natural Gas Co., Buffalo; secretary, Joseph McKee, United Gas & Fuel Co., Hamilton. Directors, who were reelected, are: J. B. McNary, Hamilton; J. A. McNevin, K. C. and T. Weir, Chatham; George H. Smith, Port Colborne, and Gordon D. Wickett, Windsor.

The annual golf tournament and a tour of the Sovereign Potteries plant at Hamilton featured the Thursday afternoon program. A brief business session was held in the evening.

Friday morning was devoted to addresses and papers. H. Carl Wolf, managing director of the American Gas Association, extended fraternal greetings in a talk on "The Gas Industry in a New Age." Addresses were also given by Merle Thorpe, director of business development, Cities Service Co., on "We Must Plan Beyond the Production Line," and by Eugene Milener, A. G. A. coordinator of general research, on "What's Developing Through Our Research."

The concluding paper by Col. W. L. Dutton, engineer of the Union Gas Co. of Canada, Ltd., was on construction problems encountered in bringing Texas gas into Canada. The address was illustrated by slides and depicted the laying of transmission lines under the Detroit river and under a maze of railroad tracks on the Canadian side. Also illustrated were plans, involving the use of two compressor stations, for delivering the gas through a 63-mile transmission line to the Dawn field for storage.

In the afternoon, a questionnaire, conducted by Vice-President Severson, dealt with such topics as the best methods of protecting domestic regulators on high pressure lines from freezing; the cause and correction of internal corrosion on high and intermediate pressure lines, and practical and economical methods of cleansing gas sands in small producing wells.

A tribute to the late C. E. Steele of Port Colborne, president emeritus and for many years president, featured the memorial for departed members, presented by E. C. Steele of Chatham. The afternoon session concluded with a technicolor sound film, "The Miracle Flame."

The convention concluded Friday evening with the annual banquet at the Royal Connaught Hotel, President Morse, toastmaster.

Obituary

J. GEORGE MERKLE, general supervisor of appliance sales and promotion, The Southern California Gas Co., succumbed to a sudden heart attack as he reached home from his office on May 9.

Mr. Merkle was born in Pennsylvania in 1905. He attended public school in San Bernardino and received his higher education at the University of Washington and the University of Southern California. He began his gas company career before he finished college, working in the Engineering Department in San Bernardino during the summer.

In 1931, he entered the Sales Department. The next year he was transferred to Los Angeles where he finally became Assistant General Supervisor of Domestic Sales in June, 1936. During the war he acted as Manpower Coordinator in the Personnel Department. In 1944 he was transferred back to Sales in the position he held at his death.

Surviving is a wife, Isabel Merkle.

OLIN K. SMITH, chemical engineer for The United Light & Railways Service Co., Davenport, Iowa, since 1922, died at his home June 14 after an illness of several months.

Mr. Smith has been interested in American Gas Association affairs since 1923 and was a member of the Technical Section where he served on the Distribution Subcommittee on Pipe Coatings and Corrosion. He was a graduate of Pratt Institute and also studied at Columbia University.

Surviving are a wife, a son and a daughter.

THEODORE D. CROCKER, president of the Northern States Power Co., Minneapolis, Minn., since 1943, died in the hospital June 29 following a brief illness.

Mr. Crocker had been associated with the utility for 30 years and was a member of the American Gas Association. Surviving are a wife, a daughter and a son.

GAS AIR CONDITIONING

(Continued from page 319)

and rechecked. The outcome is a modern, attractive, streamlined gas unit that provides heating, cooling and independent air circulation for today's home.

The gas industry was first to produce all-year air conditioning for the home with all the equipment in one package. These units are fully automatic and selective and require a minimum of service. They are designed for installation in basements, on main floors or in utility rooms. Each unit provides a maximum of home comfort and by filtering air eliminates a large amount of cleaning that ordinarily is necessary.

BALTIMORE NEIGHBORHOOD COOKING SCHOOLS

(Continued from page 334)

interest is achieved by giving away as prizes all food prepared during the daily session. The drawings for these prizes are an excellent finale for the day's work. Valuable statistics, such as attendance, repeat attendance, the effect of weather, comments and helpful information are obtained from registration cards which are collected at the end of the school. Periodic questionnaires are also used as an aid to the Home Service Department.

Results from the cooking schools have been very gratifying. In 1946 we conducted only 18 schools but had a total daily attendance of 9,151. A high percentage of the women attended at least five sessions and many attended all. We have no tangible way of assessing the load added to the company's lines but records indicate increases after each neighborhood school. Moreover, demands for products used at the schools are such that on many occasions neighborhood grocers have asked in advance for the menus to be used.

The public press has supplied valuable publicity. The Baltimore Nutrition Committee has described these schools as one of the most effective pieces of Welfare educational work being conducted in the city. The Department of Public Welfare has also written up the project in its annual booklet and states that its clients have indicated the benefits obtained from the classes.

These schools are invaluable—they build good public relations, promote the use of gas and create a desire for new type appliances. We believe that more good can be accomplished by going out to the public than by making it necessary for customers to come to the Home Service Bureau. Therefore we are currently training an additional force which will put into operation a second school to meet public demand.

AS HOT AND BLUE AS A GAS FLAME

(Continued from page 333)

published in the May issue of *Better Homes and Gardens*, used gas range drawings to illustrate kitchen arrangements. The same magazine carried four top-of-the-range pictures in three recipe features.

"Pop's in the Kitchen," said *Parents'* magazine in its June issue. "Pop" is photographed mixing his favorite recipe into a skillet on a gas range top.

Handsome husband kisses beautiful bride while she's busy cooking her man a delicious meal on a gas range—is the feature four-color photograph in the June issue of *McCall's*. No less than six gas range pictures were used with this four-color two-page cooking story.

The *New York Herald Tribune's This Week* magazine illustrated food and recipe stories with three different gas range views on May 11 and June 15.

"Kitchens for American Homes" in the June issue of *American Home* emphasized its recommended choice of efficient plans with four photographs of gas equipment.

Laundry and kitchen units are discussed in an article entitled "New Ways for Old" in the June issue of *What's New in Home Economics* and included gas equipment necessary and proper piping of gas for refrigerators, ranges, laundry dryers, garbage disposal units and house heating.

The May 3 issue of *The Farmer* emphasizes gas service necessary when installing refrigerators in an article entitled "Your New Refrigerator."

An advertising agency in St. Louis has its own test kitchen supervised by Thelma Reinke Lison and the story of how Mrs. Lison directs photography for national magazines, creates and supervises special diets and recipes and uses the home economics background for radio programs is told in the June issue of *Forecast*. The gas-equipped kitchen—one of two, is illustrated with agency executives testing Mrs. Lison's products.

The New York Times magazine of June 15 published an article "Preface to Home Canning," graphically illustrating proper methods with three top-of-the-range views.

Holland's July issue also features home canning and uses a gas range to point out timing of pressure cooker canning.

An automatic gas range showing top burner views illustrates a caption story called "Heat Waivers" in the July issue of *Ladies Home Journal*.

Additional reports on national gas publicity will appear in subsequent issues of the MONTHLY.

SERVICES OFFERED

Recent Graduate of Liquefied Petroleum Gas Institute, former **Manager** 2500 Meter Water Gas property, seeks new connection. Not averse to foreign service, having lived in Mexico and speaking Spanish. (35) **1546.**

A man with large acquaintance and years of successful **Engineering Sales Experience** in gas field desires connection with well established company. If you have a sales problem I would like to talk it over with you. **1547.**

Gas Engineer—Young, available immediately, two years' experience in c.w. gas manufacture. One as cadet; large metropolitan gas company. One as Supt. of Manufacture in overseas gas plant of large American Corp. Also two years' distribution experience. Graduate, Licensed Engineer; speak some Spanish. Single, veteran, best references. Excellent health. **1548.**

Successful **Consultant,** 17 years' experience in developing and stabilizing Net Revenues for Gas and Electric operations. Three and one half years field service Army Engineers. Having traveled continuously wishes permanent position and fixed base with progressive utility. Can get things done. **1549.**

Salesman—Several years of experience selling heating and cooking appliances of every description in various territories. Ability and experience to operate a stove department, direct the efforts of a selling organization promoter of specialties, etc. No preference as to territories; will travel anywhere. Only interested in a lucrative arrangement. **1550.**

Labor Relations Man. Practical, engineering and legal backgrounds. 18 years diversified experience, manual labor, engineering, management, personnel, labor relations large nationally known manufacturer. B.S., M.E., LL.B. degrees. Licensed professional engineer New York and Ontario. Member N. Y. Bar. Commander USNR. Considerable success in dealing with labor groups. (37) **1551.**

Gas Engineer—Graduate M.E. Public Service Commission Experience, Gas Utilities, Engineering Surveys and Reports, Reports on Contracts. Professional Engineering License Pending. (28) **1552.**

POSITIONS OPEN

Operating Engineer with C. W. Gas experience, college graduate, and demonstrated administrative ability to have entire charge of engineering and operating production department of large Eastern Gas Company. Excellent opportunity at attractive salary. **0495.**

Home Economics Representative to take charge of department which will be organized consisting of one director and one or two assistants. Activities will include platform lectures, and other home service work covering foods and proper uses of appliances. Please write and give qualifications, age, education, experience, salary expected, etc. Correspondence strictly confidential. Good salary and excellent opportunity for advancement. **0496.**

General Superintendent to supervise over all operation of combination coal and water gas plant and distribution department. Experienced in handling personnel. Plant located in North Carolina with approximately 300 million per year. **0497.**

Product Development Engineer, must be familiar with all types of gas appliances. Have experience to take charge of development, experimental design and test work on valves and controls for gas appliances. Good chance for advancement with well-established valve manufacturer. Write, giving experience in detail and salary expected. **0498.**

Manager-Superintendent for three small neighboring Eastern networks totalling 5000 meters water gas and LP-gases including potential bottled gas fringe system. **0499.**

Accounting Methods Specialist who has had a broad, successful experience in utility general accounting methods and procedures. Must have ability to sell himself to others. Knowledge of accounting machine operation and applications essential. College or accounting school graduate. Good future opportunity for right man. Some travelling. Give complete information including salary expected. **0500.**

Assistant Superintendent Water Gas Plant making Synthesis Gas in thirteen 11 foot U.G.I. units. Experienced man with a technical educational background desired, salary commensurate with ability and experience, large Chemical Plant located in northern West Virginia. **0501.**

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AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK 17, N. Y.

A. G. A. TESTING LABORATORIES • 1032 East 62nd Street, Cleveland 14, Ohio • 1425 Grande Vista Avenue, Los Angeles, Calif.

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